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Radicación : 01064212 00000000

Folios: 166

Fecha (M/D): 2001-08-07 17:40:18

Trámite : 002 PATENTES D 1 REGISTRO/ 411 PRESENTACIÓN

Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

FORMULARIO UNICO DE SOLICITUD DE PATENTE 2000-3

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SOLICITUD DE:



Patente de Invención



Patente de Modelo de Utilidad

2

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5

TITULO (54)

PREMEZCLAS Y METODO DE PREPARAR ADHESIVOS Y ASFALTOS DE LAS PREMEZCLAS

6

Clasificación Internacional (51)

C 09 J 9/00

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Prioridad

SI ☒ NO ☐

(33) País de Origen

US.
US.

(32) Fecha

Noviembre 10, 2000
Febrero 16, 2001

(31) Número de Solicitud

Prov. 60/247,639
09/785,389

8

Para publicar a partir de la fecha de la presente solicitud a los

6 meses ☐12 meses ☐18 meses ☒Otro ☐

9

Comprobante de pago No. 01-45.993 por \$356.840.00 Fecha 27 de Julio de 2001
 Comprobante de pago No. 01-45.967 por \$100.000.00 Fecha 27 de Julio de 2001
 Comprobante de pago No. 01-45.968 por \$ 100.000.00 Fecha 27 de Julio de 2001

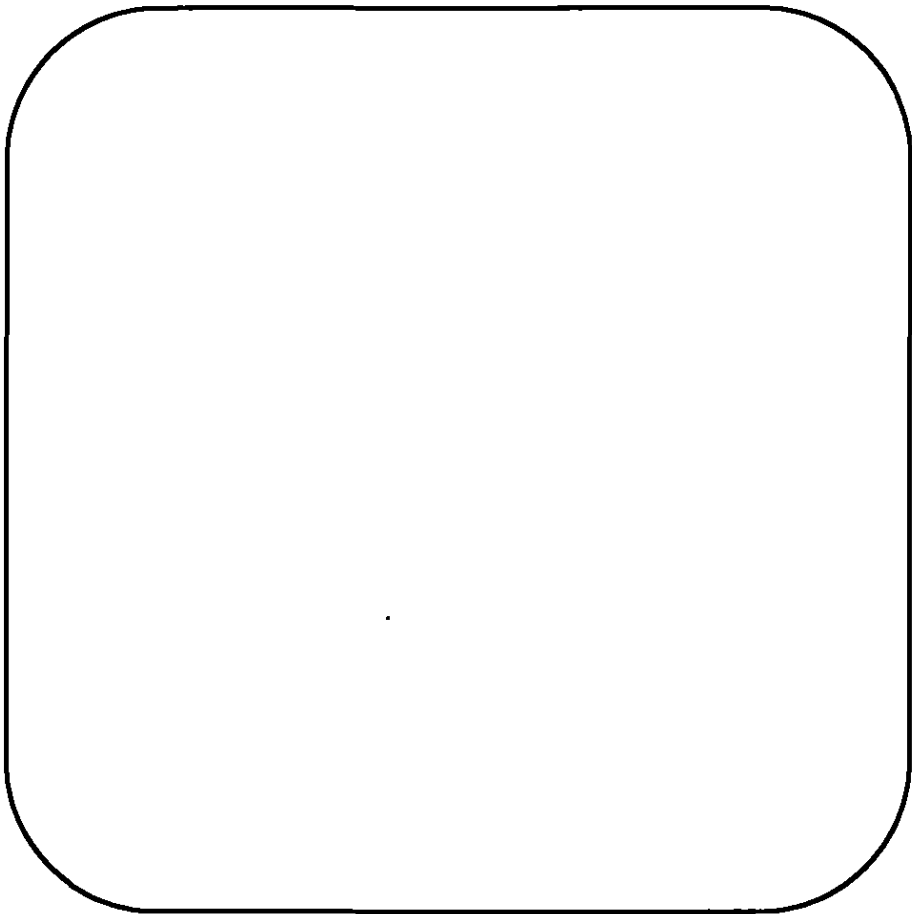
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ANEXOS

- ☒ Comprobante de pago de la tasa de presentación de la solicitud
- ☐ Comprobante de pago de la tasa por concepto de excedente de palabras en la publicación
- ☒ Comprobante de pago por reivindicación de prioridad
- ☐ Certificado de existencia y representación legal cuando el solicitante sea persona jurídica
- ☒ Poderes, si fuere el caso
- ☒ Copia certificada de la primera solicitud, si se reivindica prioridad
- ☐ Traducción simple de la primera solicitud, si se reivindica prioridad
- ☐ Documento de cesión del inventor al solicitante o a su causante
- ☒ Descripción de la invención
- ☒ Una o más reivindicaciones
- ☐ Dibujos y/o planos necesarios
- ☐ De ser el caso, copia del contrato de acceso
- ☐ De ser el caso, documento que acredite la licencia o autorización de uso de conocimientos tradicionales de las comunidades indígenas
- ☐ De ser el caso, certificado de depósito del material biológico
- ☐ Arte final 12 x 12.

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FIGURA CARACTERISTICA:



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NOMBRE: EMILIO FERRERO

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Instrucciones para el diligenciamiento del presente formulario, ver reverso de esta página

PREMEZCLAS Y METODO DE PREPARAR ADHESIVOS Y ASFALTOS DE

LAS PREMEZCLAS

ANTECEDENTES DE LA INVENCION

CAMPO DE LA INVENCION

Esta invención se relaciona con conjuntos de métodos de premezclas de aglomerantes para preparar adhesivos y asfaltos de conjuntos de premezclas, y métodos de preparar rangos de adhesivos de asfaltos de las corrientes de las premezclas.

En las solicitudes de patente estadounidense copendientes series Nos. 60/183,655; 60/183,656; y 60/247,639; describe unas prepinturas y métodos de elaboración de pinturas con elementos de estas prepinturas que emplean diferenciación del producto demorad. El uso de conjuntos de ingredientes premezclados o de materias primas según se describe en estas solicitudes se puede extender a la preparación de adhesivos.

La formulación de adhesivos involucra la selección y mezcla apropiada de los ingredientes del adhesivo en las proporciones correctas para proporcionar un adhesivo con propiedades de procedimiento y manejo específicas, así como también las propiedades de las películas adhesivas seca final deseada. Los ingredientes finales de muchos adhesivos son el aglomerante, agarrador opcional, y un fluido medio si la formulación no es completamente pura, el fluido medio es, agua si el adhesivo es un adhesivo que lleva agua, o solventes si el adhesivo es un adhesivo que lleva solvente. Los ingredientes opcionales comunes incluyen desespumantes, coalescentes, plastificadores, espesantes, modificadores de reología, solventes, secadores, agentes antideslizantes, tensoactivos, deshumidificantes, biocidas, reticuladores, pigmentos opacificantes blancos, pigmentos extendedores, colorantes y dispersantes. Después de que formula un adhesivo fluido y se aplica a la superficie, el adhesivo seca por evaporación y el aglomerante forma una película que contiene el pigmento y las partículas extendedoras, si existe alguna.

La formulación de adhesivo es compleja - no es simplemente un asunto de mezclar un poco de ingredientes

en diferentes proporciones. En su lugar, esta involucra la selección y mezcla de diferentes ingredientes en diferentes proporciones dependiendo del tipo de adhesivo deseado. Esto requiere que los fabricantes almacenen muchos diferentes ingredientes y cambios de ingrediente durante la manufactura dependiendo del adhesivo del tipo de adhesivo específico que está siendo preparado. Adicionalmente, se requiere que aquellos involucrados en la cadena de suministro y en particular, los vendedores al detalle de adhesivo, lleven un gran inventario de adhesivos con el fin de ofrecer un rango de adhesivo, tales como varios niveles de pelado, niveles de viscosidad, niveles de adhesión, niveles de removilidad, y niveles de reposicionabilidad.

Desde la perspectiva del número de ingredientes requerido, la formulación de un adhesivo es menos compleja que la formulación de una pintura arquitectónica. Sin embargo, el procesamiento y aplicaciones de uso final de un adhesivo pueden involucrar un más amplio rango de condiciones de las que típicamente se experimentan durante la aplicación de la pintura arquitectónica. Por ejemplo, un adhesivo puede ser aplicado a índices de corte variantes dependiendo del

equipo de procesamiento utilizado, (por ejemplo, extrusión, aplicadores tipo varilla de fotograbado y mayer, recubrimientos con rodillo y boquilla y similares) y utilizadas en un amplio rango de temperaturas (por ejemplo, desde menores de 0° C en temperaturas bajas o aplicaciones para toda temperatura a mayores de 40° C en al menos aplicaciones de empaque).

Por lo tanto, sería deseable hacer adhesivos, bien sea relativamente gran escala de planta industrial o relativamente a pequeñas escala, punto de aplicación, punto de venta, o sitio de punto de uso, utilizando un número limitado de ingredientes, para preparar todos estos diferentes adhesivos, minimizando así el número y tipo de ingredientes requeridos para hacer un rango de adhesivos. De esta manera, sería útil tener un sistema que le permitiera al fabricante, vendedor, o usuario ajustar el adhesivo en el punto de elaboración, venta o aplicación, para que se ajuste al procesamiento y condiciones de uso final.

RESUMEN DE LA INVENCION

La presente invención proporciona conjuntos de aglomerantes de premezclas fluidas, una o más líneas de adhesivos, y un rango de adhesivos. Un "fluido", como se utiliza aquí, significa cualquier material que fluye incluyendo líquidos, polvos fluibles, y viscosos, sólidos amorfos. Como se utiliza aquí, las premezclas son "mutuamente compatibles" si los adhesivos formados al mezclar las premezclas no evidencias signos de inestabilidad coloidal tales como la floculación. Preferiblemente, los adhesivos formados de las premezclas exhiben menos de 5 gramos de residuo, tales como gel y arena, por litro de adhesivo cuando el adhesivo es pasado a través de una pantalla con malla 325, más preferiblemente menor de 1 gramo de residuo por litro. Preferiblemente, las premezclas exhiben menos de 5 gramos de residuo, tales como gel y arena, por litro de premezcla cuando pasan a través de una pantalla malla 3,25, más preferiblemente menos de un gramo de residuo por litro de premezcla. Si las premezclas y aditivos opcionales incluidos para mejorar las propiedades específicas del adhesivo son completamente compatibles, es decir, pueden ser mezcladas en cualquier proporción

sin inducir inestabilidad coloidal, entonces ellas pueden ser combinadas en cualquier combinación que caiga dentro del espacio de formulación necesario para nombrar el perfil de propiedad deseado en el adhesivo final. Es suficiente, sin embargo, si las premezclas y aditivos opcionales se pueden combinar a proporciones deseadas sin inducir inestabilidad coloidal para lograr el perfil de propiedad deseado en los rangos de adhesivos. Como se utiliza aquí, "adhesivo" se utiliza en amplio sentido para incluir todos los tipos de adhesivos que incluyen adhesivos puntos, que llevan agua, y que llevan solventes, incluyendo adhesivos sensibles a la presión y adhesivos no sensibles a la presión. Los adhesivos sensibles a la presión ("PSA") que se pueden hacer mediante el método de la invención incluyen cualquier PSA convencional incluyendo, sin limitación, los adhesivos de fundido en caliente, los adhesivos de caucho basados en solvente, los adhesivos de emulsión de caucho de estireno-butadieno, y los adhesivos de acrílico. Tales PSA se emplean en un número de aplicaciones, por ejemplo en cintas y aplicaciones de etiqueta. Esta definición de "adhesivo" pretende incluir productos convencionalmente conocidos como sellantes, segmentos de unión, yesos,

pastas, adhesivos de baldosas cerámicas, asfaltos, y adhesivos de construcción en general.

Una "línea de adhesivo", como se utiliza aquí, incluye al menos dos deferentes adhesivos que ofrecen propiedades que difieren materialmente una de la otra en al menos una propiedad observable, tales como la adhesión a ciertos sustratos, viscosidad, removilidad, y reposicionabilidad. Los fabricantes de adhesivos y los vendedores al detal típicamente ofrecen un rango de adhesivos, el rango incluye al menos dos líneas de adhesivos. Por "el rango incluye al menos dos líneas de adhesivos", como se utiliza aquí, significa que los niveles discretos elegidos de la propiedad observable que define una primer línea de adhesivo se combina con los niveles discretos elegidos de la propiedad observable que define una segunda línea de adhesivo, etc. para definir los adhesivos en el rango de adhesivos. Por ejemplo, preparar un rango de adhesivos que incluye cinco líneas puede requerir preparar adhesivos que comprenden dos niveles de pelado, dos niveles de viscosidad, dos niveles de adhesión, dos niveles de removabilidad, dos niveles de reposicionabilidad, y preferiblemente todas las combinaciones de estas. De esta manera, se pueden

requerir 32 diferentes formulaciones de adhesivos (2 x 2 x 2 x 2 x 2). También están comprendidas, sin embargo, en un rango de adhesivos en los cuales se omiten cierto número de líneas o premezclas de adhesivos incluyendo valores tan altos como 10-60% del número total, por ejemplo, por razones comerciales o por razones de estabilidad.

Un conjunto de diferentes, pero mutuamente compatibles premezclas aglomerantes de adhesivo fluido suficientes para formular al menos una línea adhesiva comprende (a) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado de al menos 20 onzas/pulgada, un agarre menor de aproximadamente 300 gramos, y un corte mayor de aproximadamente 50 horas; (b) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a aproximadamente 50 onzas/pulgada, un agarre de aproximadamente 300 a aproximadamente 500 gramos, y un corte de aproximadamente 5 a aproximadamente 50 horas, y (c) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado mayor de aproximadamente 50 onzas/pulgada, un agarre mayor de aproximadamente 500

gramos, y un corte menor de aproximadamente menor de aproximadamente 10 horas, preferiblemente, el número de premezclas va de 3 a 15.

La presente invención también proporciona una composición adhesiva que comprende el conjunto de premezclas como se estableció anteriormente, y opcionalmente al menos un ingrediente adicional seleccionado del grupo que consiste de una pegajosidad, un espesante y reticulador.

Opcionalmente, al menos una de las premezclas comprende además al menos un aditivo opcional seleccionado de un grupo que consiste de una pegajosidad, un clasificador, un espesante y un reticulador.

También se proporciona un método de formulación de al menos una línea de adhesivo, cuyo método comprende las etapas de:

- (a) Suministrar el conjunto de diferentes, pero mutuamente compatibles, premezclas de aglomerante de adhesivo fluidas, que comprende:

- (i) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de 20 onzas/pulgada, una pegajosidad de menos de aproximadamente 300 gramos y un corte mayor de aproximadamente 50 horas;
 - (ii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a 50 onzas/pulgada, una pegajosidad Polyken de aproximadamente 300 a aproximadamente 500 gramos, y un corte de aproximadamente 5 a aproximadamente 50 horas; y
 - (iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado mayor de aproximadamente 50 onzas/pulgada, una pegajosidad Poliken mayor de aproximadamente 500 gramos y un corte menor de aproximadamente 10 horas; y
- (b) suministrar una cantidad predeterminada de cada una de las premezclas en recipientes o aplicador (es) para formar la línea de

adhesivo. Preferiblemente, el número de premezclas va de 13 a 15.

Proporcionar además un método de proporcionar un rango de adhesivos, el rango comprende al menos dos líneas de adhesivos, cuyo método comprende las etapas de:

- (a) seleccionar el conjunto de diferentes, pero mutuamente compatibles, premezclas de aglomerante de adhesivo fluidas, que comprende:
 - (i) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 onzas/pulgada, una pegajosidad Poliken de menos de aproximadamente 300 gramos y un corte mayor de aproximadamente 50 horas;
 - (ii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a aproximadamente 50 onzas/pulgada, una pegajosidad Polyken de aproximadamente 300 a aproximadamente 500

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gramos y un corte de aproximadamente 5 a aproximadamente 50 horas;

(iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado mayor de aproximadamente 50 onzas/pulgada, una pegajosidad Poliken mayor de aproximadamente 500 gramos y un corte menor de aproximadamente 10 horas; y

(iv) al menos una premezcla adicional diferente seleccionada de (i), (ii), o (iii); y

(b) suministrar una cantidad predeterminada de cada una de las premezclas en recipientes o aplicador (es) para formar la línea de adhesivo. Preferiblemente, el número de premezclas va de 4 a 15.

Los métodos aquí enunciados pueden comprender además las etapas de proporcionar al menos una pegajosidad, al menos un espesante, al menos un reticulador, o combinaciones de estos. Las cantidades predeterminadas

del agarrador, espesante; y/o reticulador se suministran en recipientes o el aplicador (es).

También se proporciona un conjunto de diferentes premezclas suficientes para formar al menos una línea adhesiva diferente, cuyo conjunto comprende al menos dos diferentes, pero mutuamente compatibles, premezclas aglomerantes adhesivas fluidas seleccionadas del grupo que consiste de (a) al menos una premezcla que comprende al menos un prepolímero curable que forma un aglomerante polimérico que tiene un Tg de aproximadamente -70° C a aproximadamente 0° C cuando se cura; (b) al menos una premezcla fluida que comprende al menos un prepolímero curable que forma un aglomerante polimérico que tiene un Tg de aproximadamente -10° C a aproximadamente 70° C cuando se cura; (c) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un Tg de aproximadamente 0° C a aproximadamente 30° C; (d) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un Tg de aproximadamente -15° C a aproximadamente 15° C; y (e) al menos una premezcla que comprende al menos un aglomerante polimérico de al menos un Tg de aproximadamente -70° C a aproximadamente 0° C.

También se proporciona un método para proporcionar al menos una línea de adhesivo, cuyo método comprende las etapas de (a) proporcionar un conjunto de diferentes, pero mutuamente compatibles, premezclas aglomerantes de adhesivo fluido que comprende al menos dos premezclas seleccionadas del grupo que consiste de (i) al menos una premezcla que comprende al menos un prepolímero curable que tiene un Tg de aproximadamente -70° C a aproximadamente 0° C cuando se cura; (ii) al menos una premezcla que comprende al menos un prepolímero curable que tiene un Tg de aproximadamente -10° C a aproximadamente 70° C cuando se cura; (iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un Tg de aproximadamente 0° C a aproximadamente 30° C; (iv) al menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de -15° C a cerca de 15° C; y (v) por lo menos una premezcla que comprende por lo menos un aglomerante que polimérico que tiene un Tg de cerca de -70° C a cerca de 0° C; y (b) dispensar una cantidad predeterminada de cada una de las premezclas dentro de contenedores o de un aplicador para formar una línea de adhesivo.

Se suministra adicionalmente un método para suministrar un rango de adhesivos, el rango comprende por lo menos dos líneas de adhesivo, dicho método comprende las etapas de:

- (a) suministra un conjunto de premezclas de aglomerante adhesivo fluido diferentes, pero mutuamente compatibles, que comprende por lo menos tres premezclas seleccionadas a partir del grupo que consiste de (i) por lo menos una premezcla que comprende por lo menos un prepolímero curable que tiene un Tg de cerca de -70°C a cerca de 0°C cuando está curado; (ii) por lo menos una premezcla que comprende por lo menos un prepolímero curable que tiene un Tg de cerca de -10°C a cerca de 70°C cuando está curado; (iii) por lo menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de 0°C a cerca de 30°C ; (iv) por lo menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de -15°C a cerca de 15°C ; (b) por lo menos una premezcla que comprende por lo menos

un aglomerante polimérico que tiene un Tg de cerca de -70° C a cerca de 0° C; y (vi) por lo menos una premezcla diferente adicional seleccionada de las premezclas (i), (ii), (iii), (iv), y (v); o (b) dispensar una cantidad predeterminada de cada una de las premezclas en contenedores o aplicadores para formar líneas de adhesivos.

Los métodos de aquí pueden adicionalmente comprender las etapas de agregar materiales que promuevan la aplicación o el comportamiento final del adhesivo, tales como pegadores, plastificadores, espesadores, reticuladores, y mezclas de ellos.

Los calafateadores son similares a adhesivos y sellantes en que ellos están basados en polímeros suaves. Muchos calafateadores también son similares a pinturas en cuanto ellos pueden ser llenados con pigmentos y extendedores. Los calafateadores se diferencian por su alto contenido en sólidos y alta viscosidad y su uso para llenar y sellar grietas, uniones, y similares.

Si una línea de adhesivos es deseada, por ejemplo, si una propiedad clave va a ser variada (por ejemplo, pelado, viscosidad, adhesión, removilidad, y reposicionabilidad), entonces la línea de adhesivo completa puede ser hecha a partir de una de cada de las premezclas (i), (ii), y (iii) que se describen anteriormente o alternativamente a partir de por lo menos dos de (a) a (e) que se describieron anteriormente.

Si un rango de adhesivos incluye dos líneas de adhesivos es lo que se desea, por ejemplo, si dos propiedades claves son variadas, (por ejemplo dos propiedades seleccionadas a partir de pelado, viscosidad, adhesión, removilidad, y reposicionabilidad), entonces el rango de adhesivos puede ser hecho de por lo menos una de cada una de las premezclas (i) a (iii) y por lo menos una premezcla adicional pero diferente seleccionada de las premezclas (i) a (iii) o alternativamente, de por lo menos dos de las premezclas (a) a (e) descritas anteriormente y por lo menos una premezcla diferente adicional seleccionada de las premezclas (a) a (e) descritas anteriormente dependiendo de qué propiedades claves van a ser variadas.

Si se desea un rango de adhesivos que incluye tres líneas de adhesivo, por ejemplo, si dos propiedades claves van a ser variadas (por ejemplo, tres propiedades seleccionadas a partir de pelado, viscosidad, adhesión, removilidad, y reposicionabilidad), entonces el rango de adhesivos puede ser hecho a partir de por lo menos una de cada una de las premezclas (i), premezclas (ii), y premezclas (iii) y por lo menos dos premezclas diferentes adicionales seleccionadas a partir de (i), (ii), o (iii) o alternativamente por lo menos una de cada una de las premezclas (a) a (e) y por lo menos dos premezclas diferentes adicionales seleccionadas a partir de (a) a (e), dependiendo de qué propiedades clave van ser variada.

Si lo que se desea es un rango de adhesivos que incluya 4 líneas de adhesivo, por ejemplo, si cuatro propiedades clave van a ser variadas (por ejemplo, cuatro propiedades seleccionadas a partir de pelado, viscosidad, adhesión, removilidad, reposicionabilidad), entonces el rango de adhesivos puede ser hecho de por lo menos una de cada una de las premezclas (i), premezcla (ii), y premezcla (iii) y por lo menos tres premezclas diferentes

adicionales seleccionadas a partir de (i) a (iii), dependiendo de que propiedades clave van a ser variadas.

Esta técnica puede continuar variando tantas propiedades clave adicionales como se desee.

Por "premezcla adicional seleccionada a partir del grupo que consiste de (i), (ii), y (iii)" se quiere decir una premezcla de aglomerante adhesivo que es diferente de las premezclas de adhesivo (i), (ii), o (iii), respectivamente, pero que de otra manera cumple con las limitaciones asociadas con las premezclas (i), (ii), y (iii). Por "premezclas adicionales seleccionadas a partir del grupo que consiste de (a), (b), (c), y (d), y (e)" se quiere decir aquí una premezcla de aglomerante adhesivo diferente de la premezcla (a), (b), (c), (d), o (e), respectivamente, pero de otra manera que cumple con las limitaciones asociadas con las premezclas (a), (b), (c), (d), (e).

En cada una de las modalidades anteriores, las premezclas son seleccionadas para cubrir un amplio espacio de formulación tal que las propiedades adhesivas finales deseadas descansan dentro del espacio de mezcla

definido por las premezclas en los extremos. En muchos casos, las premezclas no serán ellas mismas adhesivas prácticos, pero empujando las premezclas a aquellos extremos uno puede maximizar el espacio de mezcla disponible para el sistema adhesivo. Cuando las premezclas, aditivos y colorantes son completamente compatibles, ellos pueden ser mezcladas en las proporciones deseadas para lograr las líneas de adhesivo deseadas y el rango de adhesivo sin inducir en estabilidad coloidal.

Esta técnica es similar a los principios de diseño usados en diseño y análisis experimental estadístico de diseños de componentes de mezcla; sin embargo, en lugar de diseñar un espacio de mezcla para explorar la superficie de respuesta dentro de esta, uno está diseñando los límites del espacio de muestra para maximizar la flexibilidad del sistema adhesivo. La clave al éxito es poner compatibilidad mutua de los ingredientes individuales y las premezclas en todo el espacio de mezcla.

Las propiedades de adhesivo pueden ser previstas de diferentes maneras. Una enseñanza es desarrollar unos

modelos de superficie de respuesta del espacio de mezcla usando las herramientas estadísticas de diseño experimental de componentes de muestra estándar. Estos modelos estadísticos simples pueden ser usados por un programa de diferenciación lineal, por una búsqueda de malla masiva, o por unas herramientas de análisis gráfico. Otra enseñanza es simplemente usar métodos empíricos para determinar qué mezclas son necesarias para líneas de adhesivo específicas y luego incorporar estas recetas empíricas simples en el software de máquina fabricante de adhesivo.

Una extensión de estas técnicas es tener la máquina de adhesivo automáticamente preensayada en cuanto a ciertas propiedades claves (por ejemplo, viscosidad, adhesión a ciertos sustratos, pelado, pegado, y desgarre) y hacer ajustes menores durante la formulación de los adhesivos de las premezclas. Teniendo enlaces de realimentación en la máquina de adhesivo se pueden suministrar una mayor precisión en cuanto a clase de color, adhesión, esfuerzo de pelado, pegajosidad, esfuerzo de desgarre, y objetivos de viscosidad.

Se prefiere que todas las premezclas fluidas empleadas aquí tengan la misma o viscosidades similares para ayudar en la mezcla. La fluctuación de viscosidad en la formulación de adhesivo final es esperada que se reduzca debido al equilibrio a priori de los ingredientes en las premezclas.

Las premezclas son formuladas para maximizar la flexibilidad de la fabricación del adhesivo. En vez de comprar ingredientes de adhesivo individuales, los fabricantes de adhesivo, y aún los compradores en los puntos de venta y puntos de uso (almacenes de mejoramiento de casas, departamentos de productos para construcción, y contratantes), pueden comprar el conjunto de premezclas necesarias para preparar un rango deseado de adhesivo. Estos conjuntos de premezclas contendrán por lo menos una de las premezclas (i), (ii), y (iii) y posiblemente premezclas adicionales dependiendo de la flexibilidad de formulaciones deseada. Opcionalmente, las premezclas anteriores son mezcladas con una premezcla adicional que incluye por lo menos un colorante tal como un pigmento o tinta coloreada.

Los conjuntos y métodos de la invención pueden ser usados para calafateadores.

La selección de aglomerante es el mayor factor en la producción de un calafateador que tiene el conjunto deseado de propiedades. Aquellos versados en la técnica reconocen fácilmente que las características del aglomerante tales como el nivel de sólidos, la selección de monómero, el peso molecular, los módulos Tg y muchos otros factores influyen las propiedades del calafateador. Aquellos versados en la técnica también reconocen cualitativamente cómo controlar estas características para obtener las propiedades calafateadoras deseadas. Tales propiedades incluyen el balance entre resistencia a la tensión contra elongación/flexibilidad, adhesión, pegajosidad de la superficie, agrietamiento en canal, claridad, amarillez, encogimiento y costo. Mientras que una relación cuantitativa entre características de aglomerante y propiedades es difícil de obtener, aquellos versados en la técnica puede fácilmente seleccionar los aglomerantes apropiados para usar en las premezclas de aglomerante para producir las propiedades calafateadoras deseadas.



En la modalidad calafateadora, el conjunto comprende (a) por lo menos una premezcla aglomeradora calafateadora que comprende por lo menos un aglomerante polimérico tal que tiene un Tg de menos de cerca de 0° C; (b) por lo menos de cerca de 0° C; (b) por lo menos una premezcla de aglomerante que comprende por lo menos un aglomerante polimérico que tiene un Tg de menos de cerca de 25° C y (c) opcionalmente, por lo menos una premezcla extendedora que comprende por lo menos un extendedor; en donde las premezclas tienen un contenido sólido de por lo menos cerca de 50% en peso.

También se suministra un método para formar por lo menos una línea de calafateador, dicho método comprende las etapas de:

- (b) suministrar un conjunto de premezclas de aglomerante calafateador fluido diferentes, pero mutuamente compatibles, suficiente para formar por lo menos una línea de calafateadores, dicho conjunto comprende (i) por lo menos una premezcla de aglomerante que

comprende por lo menos un aglomerante polimérico que tiene un Tg de menos de cerca de 0° C; (ii) por lo menos una premezcla de aglomerante que comprende por lo menos un aglomerante polimérico que tiene un Tg de menos de 25° C; (iii) por lo menos una premezcla extendedora que comprende por lo menos un extendedor; en donde las premezclas tienen un contenido de sólidos de por lo menos cerca de 50% en peso; cerca de 30° C; (iv) dispensar una cantidad predeterminada de cada premezcla en contenedores o aplicadores para formar por lo menos una línea de calafateador.

La premezcla extendedora puede comprender adicionalmente por lo menos un pigmento de opacificante. Alternativamente o adicionalmente, el conjunto de premezclas de calafateador puede adicionalmente comprender por lo menos una premezcla fluida mutuamente compatible, que comprende por lo menos un pigmento opacificador.

Los métodos de la presente pueden comprender adicionalmente la etapa de mezclar las premezclas de

adhesivo o de aglomerante calafateador antes, mientras, o después de que ellos han sido dispensados dentro de los contenedores. El método puede comprender adicionalmente la etapa de mezclar estas premezclas antes o mientras son dispensadas dentro de los aplicadores. Los métodos pueden incluir adicionalmente la etapa de ajustar la viscosidad de estas premezclas antes, mientras, o después de que son dispensadas dentro de sus contenedores o antes o mientras son dispensados dentro de los aplicadores. Los métodos presentes pueden ser llevados a cabo continuamente en una industria fabricante, en un distribuidor, en un punto de venta, o en un punto de uso. Adicionalmente, los métodos pueden ser controlados por un computador. Por "premezcla adicional ["a", "b", o "c"] se quiere decir una premezcla calafateadora diferente de las premezclas de aglomerante calafateador (a) y (b) y la premezcla extendedora de calafateador (c), respectivamente, pero de otra manera que cumple con las limitaciones asociadas con las premezclas de calafateador (a), (b) y (c).

Mientras se ha ejemplificado con un adhesivo sensible a la presión y un calafateador, los presentes métodos no están limitados a preparar solamente adhesivos sensibles a la presión o calafateadores per se sino que

también pueden ser extendidos a la preparación de cualquier adhesivo, sellante, calafateador o producto de construcción relacionado con base en agua o con base en disolventes. Las industrias y los segmentos de mercado en donde los adhesivos y productos relacionados producidos por los presentes métodos pueden ser usados incluyen adhesivos usados para la construcción, el pegado primario y principal de madera, muebles, transporte por tierra-OEM, mercado de reposición automotriz, aeroespacio, eléctrico/electrónico, electrodomésticos, empaques, encuadernación, textiles, zapatos, abrasivos sensibles a la presión, materiales de fricción, fundición, consumidor, aerosol, médico, dental, conjunto de productos misceláneos y similares.

DESCRIPCION DETALLADA DE LA INVENCION

Las premezclas de la presente invención cada una contienen un aglomerante polimérico que tiene propiedades específicas. Los aglomerantes poliméricos son polímeros o prepolímeros que forman la película principal del adhesivo. Los aglomerantes aglomeran el pigmento, si está presente, y/o los extendedores y suministra el flujo de adhesivo requerido. Los aglomerantes seleccionados para

la premezcla dependerán del uso final del adhesivo formulado.

Aglomerantes poliméricos adecuados incluyen polímeros naturales y sintéticos disueltos en agua o disueltos en disolvente, incluyendo pero sin limitarse a, homopolímeros, copolímeros o terpolímeros tales como polímeros acrílicos y/o metacrílicos, acetato de polivinilo, polivinilalcohol, copolímeros estireno-acrílico, copolímeros estireno-butadieno, copolímeros acetato de vinilo-acrílico, copolímeros de etileno-acetato de vinilo, copolímeros de acetato de vinilo-versatato de vinilo, copolímeros de acetato de vinilo-maleato de vinilo, terpolímeros de acetato de vinilo-cloruro de vinilo-acrílico, terpolímeros de etileno-acetato de vinilo-acrílico, poliuretano, butiral polivinilo, polímeros acrílicos estructurales, anaeróbicos, polímeros de cianoacrilato, cloruro de polivinilo, cloruro de polivinilideno, polietileno, copolímeros de etileno-acetato de vinilo, polipropileno, copolímero de etileno/ácido acrílico, copolímeros de etileno/acrilato de metilo, polietileno irradiado, poliamida, poliéster, epoxi, fenólico, amino, furan, poliimidas, caucho natural, copolímeros de estireno y

tertpolímeros de estireno, copolímeros de bloque estirénico o no bloque estirénico, neopreno, caucho de nitrilo, butileno, polibuteno, cauchos de etileno-propileno-dieno, silicona de caucho, goma animal, cafeínas, almidón y flor de trigo, dextrinas, celulosa, bitumen, resina, lignina, silicato, caucho de estireno-butadieno, estireno-butadieno, acrilonitrilo-butadieno-estireno, halo-dieno, y similares. Los polímeros o prepolímeros pueden opcionalmente contener hasta cerca de 10% en peso de un monómero funcional, por ejemplo, pero sin limitarse a, ácido carboxílico, fosfato, sulfato, sulfonato, y monómeros de amida y combinaciones de ellos, monómeros no funcionales y mezclas de ellos. Los aglomerantes poliméricos son preferiblemente polímeros de látex disueltos en agua.

Con las premezclas, es opcional incluir cantidades menores, por ejemplo, menos de cerca de 20% en peso, con base en el peso total de las premezclas, de aditivos adhesivos convencionales tales como pegadores, plastificadores, reticuladores, espesadores, ácidos, bases, desespumantes, coalescentes, codisolventes, resinas dispersantes, antienmohecedores, biocidas, agentes anticongelamiento, pigmentos opacificantes,

pigmentos extendedores, colorantes, vidrio y bolitas poliméricas similares. Estos aditivos deben ser compatibles con los otros ingredientes de adhesivo en la premezcla y las premezclas empleadas en la formulación de las líneas de adhesivo. Estos ingredientes opcionales pueden ser agregados separadamente o agregados a las premezclas. En los ejemplos, el pegador, el reticulador, y/o el espesador son incluidos como ingredientes separados en vez de ser incorporados dentro de las premezclas.

Las propiedades de pegado, resistencia al pelado, resistencia al corte, que son propiedades mutuamente exclusivas frecuentemente pueden ser altamente importantes en catalogar una composición de adhesivo que sea adecuada para una aplicación particular. El pegado es generalmente una medida del flujo viscoso bajo condiciones de velocidades de esfuerzos rápidos y magnitudes de esfuerzos pequeños. La resistencia al pelado es una medida de resistencia al flujo a velocidades de esfuerzo intermedio y moderado a magnitudes de esfuerzo alto, lo mismo que el esfuerzo cohesivo del adhesivo. La resistencia al desgarre es una medida de la resistencia al flujo a magnitudes de esfuerzo intermedio.

Los aditivos poliméricos, tales como pegadores y plastificadores, pueden ser agregados para modificar las propiedades del adhesivo incluyendo, por ejemplo, el comportamiento viscoelástico del adhesivo terminado. El aditivo polimérico particular seleccionado puede variar dependiendo, por ejemplo, del adhesivo involucrado y de la modificación buscada.

Generalmente hablando, para promover las características de comportamiento del adhesivo el pegador debe poseer un cierto rango de propiedades con respecto al adhesivo al cual se agrega. Por ejemplo, el pegador debe generalmente tener un peso molecular bajo más bajo que el del polímero del adhesivo. Adicionalmente, el pegador debe generalmente tener una temperatura de transición al vidrio (T_g) mayor que aquella del polímero del adhesivo. La temperatura de ablandamiento del pegador debe generalmente ser mayor que aquella del polímero del adhesivo, y el pegador debe generalmente tener un grado mínimo de compatibilidad con el polímero del adhesivo. Pegadores adecuados incluyen los pegadores de grado sólido y dispersados tales como ésteres de rosin, ácidos

de rosin y resinas de hidrocarburo incluyendo resinas alifáticas y aromáticas y similares.

Los plastificadores pueden ser agregados a una composición de adhesivo, por ejemplo, para incrementar su trabajabilidad, flexibilidad, y/o dispensibilidad. Ellos son moléculas que son más pequeñas que las moléculas de aglomerante polimérico presentes en el sistema adhesivo. Dependiendo del sistema adhesivo involucrado, la adición de un plastificador puede disminuir la viscosidad de fusión, el módulo elástico, la temperatura de transición al vidrio (T_g) del sistema general. Los plastificadores pueden también ser agregados a formulaciones de polímero para incrementar la flexibilidad promoviendo la formación de enlaces entre las moléculas de polímero y el plastificador en donde entre las moléculas de polímero mismas. Las moléculas de plastificador separan las cadenas poliméricas grandes del aglomerante y reducen las fuerzas atractivas entre ellas y actúa como lubricante. Al hacer eso, el plastificador puede también incrementar el volumen específico y cambiar el índice de refracción de la composición adhesiva resultante. La adición del plastificador puede también incrementar la viscosidad de la composición adhesiva.

Reticuladores adecuados que incluyen metal multivalente tal como el zinc, magnesio, aluminio, calcio, hierro, circonio, y similares.

Los pigmentos opacificantes adecuados incluyen el dióxido de titanio (TiO_2) o una combinación de óxido de titanio y pigmentos ocultadores auxiliares tales como partículas de polímero de látex con vacíos, óxido de zinc, óxido de plomo, pigmentos de polímero sintético, y mezclas de ellos. Los grados rutilo y anatasa del dióxido de titanio son adecuados para el uso aquí. El dióxido de titanio rutilo es preferido. La superficie de estos dióxidos de titanio pueden ser tratadas con diversos tratamientos de superficie orgánica y/o inorgánica, por ejemplo, como los óxidos de sílice, alúmina, y circonio. El óxido de titanio ahumado también es útil aquí.

Las partículas de látex con vacíos son útiles en la presente invención tienen un diámetro del tamaño de partícula de alrededor de 100 nm hasta 2500 nm y una fracción de vacío de entre 10% a 75%. Preferiblemente, las partículas de látex con vacíos tienen un tamaño de

partícula entre 500 nm a cerca de 1.100 nm. Las partículas de látex con vacíos tienen por lo menos un vacío pero deben tener múltiples vacíos, vacíos no esféricos, vacíos interconectados, vacíos que tienen canales hacia el exterior de las partículas, y estructuras descritas como vesiculadas o similares a esponja. Preferiblemente, ellos tienen un solo vacío. Las partículas de látex con vacío tienen una temperatura de transición al vidrio (T_g) de por lo menos 20° C, preferiblemente por lo menos cerca de 50° C. Entre más alta sea la temperatura de transición al vidrio, más dura es la partícula y menos tendencia tiene a colapsarse. So las partículas de látex con vacío se colapsan ellas serían incapaces de contribuir al ocultamiento. Las partículas de látex con vacíos pueden ser preparadas por procesos de polimerización convencionales conocidos en la técnica, tales como aquellos descritos en la US-A-3,784,391, US-A-4,798,691, US-A-4,908,271, US-A-4,972,000, US-A-5,041,464, US-A-5,157,084, US-A-5,216,044 y US-A-6,020,435, también como las solicitudes de patentes Japonesas 60/223.873. 61/62510. 61/66710. 61/86941. 62/127336. 62/156387. 01/185311. y 02/140272. Preferiblemente las partículas de látex con vacíos son preparadas de acuerdo con la US-A-4,425,836 US-A-

4,469,825, US-A-4,594,363, US-A-4,880,842, US-A-5,494,971 y US-A-6,020,465.

Pigmentos extendedores adecuados para uso en la presente inclúyen el sulfato de bario (cerca de 1 a cerca de 15 micrones), blanco fijo (cerca de 0,05 a cerca de 5 micrones), carbonato de calcio (cerca de 0,05 a cerca de 35 micrones), sílice (cerca de 0,001 a cerca de 14 micrones, silicato de magnesio (cerca de 0,5 a cerca de 15, micrones), silicato de aluminio (cerca de 0,2 a cerca de 5 micrones), mica, bentonita, silicato de magnesio alumina, alúmina ahumada atapulgita coloidal, silicato de alúmino de sodio amorfo sintético, silicato de alumina potasio de sodio, y similares.

El espesante es un término general que incluye cualquier material agregado a un adhesivo para modificar su perfil reológico. Los espesantes preferidos son espesantes asociativos. Los espesantes adecuados para uso en la presente incluyen el alcohol de polivinilo (PVA), emulsiones solubles en álcali modificadas hidrofóbicamente conocidas en la técnica como emulsiones HASE. Emulsiones hinchables solubles álcali conocidas en la técnica como emulsiones HASE, polímeros de uretano de

óxido de etileno modificado hidrofóbicamente conocidos en la técnica como espesantes HEUR, y espesantes celulósicos tales como la celulosa de hidroximetilo (HMC), celulosa de hidroxietilo (HEC), celulosa de hidroxietilo modificada hidrofóbicamenhte (HMHEC), celulosa de carboximetil de sodio (SCMC), celulosa de 2-hidroxietilcarboximetil de sodio, 2-hidroxipropilmetilcelulosa, 2-hidroxietilmetilcelulosa, 2-hidroxibutilmetilcelulosa, 2-hidroxietil etil celulosa, 2-hidroxipropilcelulosa, y similares. También son útiles como espesantes el sílice ahumado, la arcilla de atapulgita, y otros tipos de arcilla, agentes quelantes de titanato, y similares.

Los dispersantes adecuados para uso en la presente invención incluyen dispersantes no iónicos, aniónicos y catiónicos tales como 2-amino 2-metil 1-propanol (AMP), dimetil amino etanol (DMAE), tripolifosfato de potasio (KTTP), polifosfato de trisodio (TSPP), ácido cítrico y otros ácidos carboxílicos, y similares. Los polímeros aniónicos tales como homopolímeros y copolímeros basados en ácidos policarboxílicos, incluyen aquellos que han sido modificados hidrofóbicamente o modificados hidrofílicamente, por ejemplo, ácido poliacrílico o ácido

polimetacrílico o anhídrido maléico con diversos monómeros tales como estireno, acrilato o metacrilato, diisobutileno, u otros comonómeros hidrofílicos o hidrofóbicos también son adecuados para usarse como dispersantes, adicionalmente incluyendo las sales de los dispersantes anteriormente mencionados y mezclas de los mismos.

Los desespumantes adecuados incluyen los díoles acetilénicos, los desespumantes con base en aceite mineral y con base en silicona, y similares.

Los coalescentes, plastificantes y otros disolventes opcionales adecuados incluyen el etilenglicol, el propilenglicol, exilenglicol, 2,2,4-trimetil-1,3-pentanediol monoisobutirato (TEXANOL™), éteres de glicol, espíritus minerales, metilcarbitol, butilcarbitol, eftalatos, adipatos y similares.

Los antienmohecedores y biocidas adecuados incluyen el óxido de zinc, isotiazolones, triazoles, y similares.

Los tensoactivos adecuados incluyen el tensoactivos catiónicos, aniónicos y no iónicos.

Para poder minimizar el número de ingredientes de adhesivo necesarios para prepara un rango de adhesivo requiere considerar los extremos de las propiedades clave requeridas para el rango de adhesivos y formular premezclas de adhesivos que son capaces de ser mezcladas en diversas combinaciones para suministrar las propiedades clave requeridas en los valores extremo y en los puntos intermedios igualmente. Las propiedades específicas también pueden ser mejoradas incluyendo aditivos de adhesivo que promueven la propiedad deseada.

Todos los rangos descritos aquí son inclusivos y los mínimos y máximos de los rangos deseados son combinables. Las medidas de pegajosidad se hacen de acuerdo con el ensayo de pegajosidad estándar PSTC a una velocidad de 12 pulgadas/minuto. La medida de pelado es hecha de acuerdo con el ensayo de pelado estándar PSTC en un tercer Polyken. Las medidas de corte son hechas en una muestra de ensayo de una pulgada cuadrada sobrepuesta con un peso de un kilogramo bajo corte estático a una temperatura entre 55 a 80° F. Todas las anteriores medidas son hechas

usando un espesor de recubrimiento de 0,9 a 1,1 min. La temperatura de transición al vidrio ("Tg") se mide por medio de calorimetría de barrido diferencial a una velocidad de 20° C/minuto.

EJEMPLOS

Ejemplo 1 - Preparación de Premezclas de Aglomerante de Adhesivo

La premezcla 1 es preparada mezclando 100 gramos de un polímero sensible a la presión acrílico (N-619 disponible de Rohm and Haas Company, Philadelphia, PA) con 0,5 gramos de un agente humectante estándar comercial no iónico o aniónico, 1,0 gramos de un estabilizador mecánico bisfenol etoxilado, y 0,5 gramos de un desespumante estándar. El pH es ajustado por encima de 8,0 con amoníaco.

La premezcla 2 es preparada mezclando 10 gramos de un polímero sensible a la presión acrílico (N-580 disponible de Rohm and Haas Company, Philadelphia, PA) con 0,5 gramos de un agente humectante no iónico o aniónico estándar comercial, 1,0 gramos de un

estabilizador mecánico de fenol etoxilado, y 0,5 gramos de un desespumante estándar. El pH es ajustado como anteriormente a 8,0 con amoniaco.

La premezcla es preparada mezclando 100 gramos de un polímero sensible a la presión acrílico (N-1031 disponible de Rohm and Haas Company, Philadelphia, PA) con 0,5 gramos de un agente humectante no iónico o aniónico estándar comercial, 1,0 gramos de un estabilizador mecánico de fenol etoxilado, y 0,5 gramos de un desespumante estándar. El pH es ajustado como antes a 12,0 con amoniaco.

Ejemplo 2- preparación de adhesivo

Los aglomerantes 1, 2, y 3 pueden ser combinados en varias proporciones junto con varios niveles de pegadores y reticulantes dispersados para producir adhesivos que tienen características adecuadas para aplicaciones sensibles a la presión tales como aplicaciones de cinta y rótulos de adhesivos sensibles a la presión (PSA). Los aditivos tienen bajas viscosidades que pueden ser aplicadas a través del grabado o aplicadores tipo Mayer

rod. Los adhesivos que tienen altas viscosidades son adecuados para recubridores de rubidio o placa.

El espesante es un espesante HASE (Acrysol TT-615 disponible de Rohm and Haas Company, Philadelphia, PA). El pegador es un éster de rosin dispersado, ácido de rosin, o un hidrocarburo. El reticulador es tipo metálico multivalente.

La formulación de las premezclas de adhesivo se muestran en la siguiente tabla.

Los niveles de ingrediente se muestran en la siguiente tabla.

Los niveles de ingrediente se dan en gramos.

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Ingredientes	Adhesión de poliols fina **	Adhesión de poliols fina	Pelado bajo de propósito general	Pelado bajo de propósito general	Pelado alto de propósito general***	Pelado alto de propósito general	Reposición nable	Reposición nable	Bajo pelado removible	Bajo pelado removible	Alto pelado removible	Alto pelado removible
Premezcla 1	50-60	50-60	--	--	70-80	70-80	20-30	20-30	--	--	10 a 20	10 a 20
Premezcla 2	--	--	40-50	40-50	--	--	70-80	70-80	10 a 20	10 a 20	--	--
Premezcla 3	5 a 20	5 a 20	40-50	40-50	--	--	--	--	80-90	80-90	80-90	80-90
Espesante	--	1 a 1,5	--	1 a 5	--	1 a 1,5	--	1 a 1,5	--	1 a 1,5	--	1 a 1,5
Pegador	20-30**	20-30	5 a 10	5 a 10	20-30**	20-30	--	1 a 1,5	--	--	--	--
Retículador	--	--	--	--	--	--	1 a 2	1 a 2	1 a 2	1 a 2	1 a 2	1 a 2
Comentarios	Adhesión a superficies de poliols fina, ** el rango resultará en una adhesión moderada a alta	Recubridores de mayor viscosidad	Resultados pueden variar entre baja adhesión a moderada para aplicaciones en rótulos	Recubridores de mayor viscosidad	Alta adhesión/dependiente de superficie ***el rango resulta en adhesión moderada a alta	Recubridores de mayor viscosidad	Rótulo PSA tiene corto término de removilidad lo que lleva a adhesión permanente	Recubridores de mayor viscosidad	Diversas removilidades sobre diferentes superficies	Recubridores de mayor viscosidad	Mayor adhesión y removilidad sobre diferentes superficies	Recubridores de mayor viscosidad

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Ejemplo 3 - Preparación de Premezclas de Calafateador

Las siguientes premezclas son útiles para la formulación de una línea de calfateadores.

Una primer premezcla aglomerante contiene un aglomerante acrílico suave que tiene un Tg de -50° C. (Rhoplex 1950, disponible de Rohm and Haas Company, Philadelphia, PA). Los contenidos de sólidos del aglomerante están entre 62 a 65%. El aglomerante acrílico suave es formulado con aditivos de calafateo bien conocidos por aquellos expertos en la técnica, tales como glicoles, tensoactivos, preservativos, antienmohecadores, desespumantes, y aditivos opcionales, tal como, xilanos para adhesión.

Una segunda premezcla aglomerante contiene un aglomerante polimérico que tiene un bajo costo, un aglomerante de vinilo o de vinilo/acrílico que tiene un Tg de -9° C (Rovace 86, disponible de Rohm and Haas Company, Philadelphia, PA) y un contenido de sólidos de cerca de 55%. Esto es formulado según la premezcla de bajo costo usando un plastificador para reducir adicionalmente el Tg y otros aditivos calafateadores

tales como aquellos usados en el aglomerante acrílico anterior.

Una premezcla extendidora es preparada por medio de moler carbamato de calcio y dióxido de titanio en agua con un dispersante y un espesante que son seleccionados para producir una premezcla estable. Esta premezcla debe estar preparada especialmente con un contenido lo más alto de sólidos como sea posible para reducir la cantidad de agua introducida dentro del calafateador. El calafateador resultante se encogerá menos cuando es usado para llenar un espacio. Debido a esto, el pigmento sólido y la carga puede ser utilizada para incrementar adicionalmente los sólidos del calafateador. El calafateador requerirá técnicas de mezclado y molido capaces de manejar su alta viscosidad.

Una premezcla de aditivo que contiene un grado sólido de celulosa de hidroxietilo (Natrosol 250MXR, Hércules, Inc., Wilmington, DE) es preparada para uso como espesante.

Ejemplo 4 - Preparación de Calafateadores

Un calafateador es preparado por medio de mezclar una o ambas premezcla aglomerantes con la premezcla extendedora. La premezcla de aditivo es entonces agregado y la mezcla resultantes es molida o mezclada en un molino sigma o mezclador Hockmeyer (Hockmeyer Equipment Corp., Elizabeth City, NC). Opcionalmente, el molino o mezclador pueden contener un tornillo de alimentación que llena los cubos de calafateador, creando un proceso continuo para la producción de calafateadores. Utilizando un método de la invención, esta producción continua de calafateadores puede suministrar una línea de calafateadores de baja demanda.

Las cuatro premezclas descritas anteriormente son usadas para producir una línea de calafateadores por medio de combinarlos en diferentes proporciones. Por ejemplo utilizando la primer mezcla de aglomerante, la premezcla extendedora, la premezcla de aditivo, un calafateador de alta calidad puede ser reproducido. Diversos grados de calafateador pueden ser suministrados usando diferentes cantidades de la premezcla extendedora. De una manera análoga, la segunda premezcla aglomerante puede ser usada para producir diversos calafateadores de más baja calidad/más bajo costo. Adicionalmente o

variaciones alternativas en calidad de calafateadores pueden ser logradas usando combinaciones de la primer y segunda premezclas de aglomerante junto con la premezcla extendedora, y la premezcla de aditivo (por ejemplo el espesador). Excluyendo a la premezcla extendedora para producir un calafateador claro. Usando uno o ambas premezclas aglomerantes resulta en un rango de calidad de calafateadores claros.

Muchas variaciones de este ejemplo son posibles. La carga y pigmento pueden ser suministrados en la forma de premezcla separada y sus proporciones y niveles pueden ser controlados de manera que las propiedades tales como adhesión y pegajosidad a la superficie puedan variar. Los calafateadores con poco o ningún dióxido de titanio pueden ser tinturados o coloreados con otros pigmentos. Los espesadores que requieren neutralización con base pueden ser utilizados, incluyendo, por ejemplo, la emulsión hinchable álcali modificada hidrofóbicamente tal como Acrysol™ TT-615 (disponible de Rohm and Haas Company, Philadelphia, PA). Cuando tal espesador es usado una base como el amoníaco o hidróxido de sodio puede ser agregada durante el mezclado o molido del calafateador. Las mezclas de espesadores también pueden ser usadas.

Muchos de esos aditivos para calafateador, tales como sílice ahumado, inhibidores de corrosión rápida, complejo de zinc, estabilizador ligero de amina ocultada y similares pueden ser empleados en diversos elementos.

REIVINDICACIONES

1. Un conjunto de premezclas de aglomerante fluido diferentes, pero mutuamente compatibles, es disuelta para formar por lo menos una línea de adhesivo, el conjunto comprende:

(i) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de 20 onzas/pulgada, una pegajosidad de menos de 300 gramos; y un corte mayor de aproximadamente 50 horas;

(ii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a 50 onzas/pulgada, una pegajosidad de 300 a aproximadamente 500 gramos y un corte de aproximadamente 5 a aproximadamente 50 horas; y

(iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado mayor de aproximadamente 50 onzas/pulgada, una pegajosidad mayor de 500 gramos, y un corte menor de aproximadamente 10 horas;

2. Un adhesivo que comprende un conjunto de premezclas de la reivindicación 1 y por lo menos un aditivo seleccionado a partir del grupo que consiste de un pegador, un plastificador, un espesador, un reticulador, y mezclas de ellos.

3. El conjunto de premezclas de la reivindicación 1, en donde el número de premezclas está entre 3 a 15.

4. El conjunto de premezclas de la reivindicación 1, en donde por lo menos una de las premezclas comprende adicionalmente por lo menos un aditivo seleccionado a partir del grupo que consiste de un pegador, un plastificador, un espesador, y reticulador.

5. Un método para formar por lo menos una línea de adhesivo, dicho método comprende las etapas de:

(a) suministrar el conjunto de diferentes, pero mutuamente compatibles, premezclas de aglomerante de adhesivo fluidas, que comprende:

(i) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 onzas/pulgada, una pegajosidad Poliken de menos de aproximadamente 300 gramos y un corte mayor de aproximadamente 50 horas;

(ii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a aproximadamente 50 onzas/pulgada, una pegajosidad Polyken de aproximadamente 300 a aproximadamente 500 gramos y un corte de aproximadamente 5 a aproximadamente 50 horas;

(iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un

pelado mayor de aproximadamente 50 onzas/pulgada, una pegajosidad Poliken mayor de aproximadamente 500 gramos y un corte menor de aproximadamente 50 horas; y

- (b) suministrar una cantidad predeterminada de cada una de las premezclas en recipientes o aplicador (es) para formar la línea de adhesivo.

6. Un método par formar un rango de adhesivo, el rango comprende por lo menos dos líneas de adhesivo, dicho método comprende las etapas de:

- (a) Suministrar el conjunto de diferentes, pero mutuamente compatibles, premezclas de aglomerante de adhesivo fluidas, que comprende:

- (i) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de 20 onzas/pulgada, una pegajosidad de menos de aproximadamente 300 gramos y un corte mayor de aproximadamente 50 horas;

- (ii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado menor de aproximadamente 20 a 50 onzas/pulgada, una pegajosidad Polyken de aproximadamente 300 a aproximadamente 500 gramos, y un corte de aproximadamente 5 a aproximadamente 50 horas; y
 - (iii) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un pelado mayor de aproximadamente 50 onzas/pulgada, una pegajosidad Poliken mayor de aproximadamente 500 gramos y un corte menor de aproximadamente 10 horas; y
 - (iv) por lo menos una premezcla aglomerante diferente adicional seleccionada de las premezclas (i) a (iii); y
- (b) dispensar una cantidad predeterminada de cada una de las premezclas en recipientes o aplicador (es) para formar la línea de adhesivo.

7. El método de la reivindicación 5 o la reivindicación 6 que comprende adicionalmente la etapa de suministrar por lo menos un aditivo seleccionado a partir del grupo que consiste de un pegador, un plastificador, un espesador, y un reticulador.
8. El método de la reivindicación 7, que comprende adicionalmente la etapa de dispensar cantidades predeterminadas de aditivo en contenedores o aplicador.
9. El método de la reivindicación 5 o la reivindicación 6, en donde por lo menos una de las premezclas comprende adicionalmente por lo menos un aditivo seleccionado a partir del grupo que consiste de un pegador, un plastificador, un descalfador y un reticulador.
10. El método de la reivindicación 5 o la reivindicación 6, en donde el número de premezclas está entre 4 a 15.

11. Un conjunto de premezclas de aglomerante fluido diferentes, pero mutuamente compatibles, suficiente para formar por lo menos una línea de adhesivo, dicho conjunto comprende por lo menos dos premezclas seleccionadas a partir del grupo que consiste de:

- (a) al menos una premezcla que comprende al menos un prepolímero curable que forma un aglomerante polimérico que tiene un Tg de aproximadamente -70° C a aproximadamente 0° C cuando se cura;
 - (b) al menos una premezcla fluida que comprende al menos un prepolímero curable que forma un aglomerante polimérico que tiene un Tg de aproximadamente -10° C a aproximadamente 70° C cuando se cura;
 - (c) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un Tg de aproximadamente 0° C a aproximadamente 30° C;
 - (d) al menos una premezcla que comprende al menos un aglomerante polimérico que tiene un Tg de aproximadamente -15° C a aproximadamente 15° C;
- y

- (e) al menos una premezcla que comprende al menos un aglomerante polimérico de al menos un Tg de aproximadamente -70°C a aproximadamente 0°C .

12. Un método para formar al menos una línea de adhesivos, dicho método comprende las etapas de:

- (a) suministrar un conjunto de premezclas aglomerantes de la reivindicación 11; y
- (b) dispensar una cantidad predeterminada de cada una de las premezclas seleccionadas en contenedores o aplicadores para formar la línea de adhesivo.

13. Un método para formar un rango de adhesivos, el rango comprende por lo menos dos líneas de adhesivo, dicho método comprende las etapas de:

- (a) suministrar un conjunto de por lo menos tres premezclas de aglomerante fluido diferentes, pero mutuamente compatibles, que son seleccionadas a partir del grupo que consiste de:

- (i) por lo menos una premezcla que comprende por lo menos un prepolímero que forma una aglomerante polimérico que tiene un Tg de cerca de -70°C a cerca de 0°C cuando está curado;
- (ii) por lo menos una premezcla que comprende por lo menos un prepolímero curable que tiene un Tg de cerca de -10°C a cerca de 70°C cuando está curado;
- (iii) por lo menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de 0°C a cerca de 30°C ;
- (iv) por lo menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de -15°C a cerca de 15°C ;
- (v) por lo menos una premezcla que comprende por lo menos un aglomerante polimérico que tiene un Tg de cerca de -70°C a cerca de 0°C ; y
- (vi) por lo menos una premezcla diferente adicional seleccionada del grupo que consiste de las premezclas (i), (ii), (iii), (iv), y (v); y

(b) dispensar una cantidad predeterminada de cada una de las premezclas en contenedores o aplicadores para formar líneas de adhesivos.

14. El método de las reivindicaciones 5, 6, 12 o 13 que comprende adicionalmente la etapa de mezclar las premezclas antes, mientras, o después que las premezclas son dispensadas dentro de los contenedores.

15. El método de las reivindicaciones 5, 6, 12 o 13, que comprende adicionalmente la etapa de mezclar las premezclas antes, o mientras, que las premezclas son dispensadas en aplicadores.

16. El método de las reivindicaciones 5, 6, 12 o 13, que comprende adicionalmente la etapa de ajustar la viscosidad de las premezclas antes, mientras, o después de que las premezclas son dispensadas dentro de los contenedores.

17. El método de las reivindicaciones 5, 6, 12 o 13, que comprende adicionalmente la etapa de mezclar

la viscosidad de las premezclas antes, mientras, o después que las premezclas son dispensadas dentro de los aplicadores.

18. El método de las reivindicaciones 5, 6, 12 o 13, en donde el método se lleva a cabo en una instalación de fabricación.

19. El método de las reivindicaciones 5, 6, 12 o 13, en donde el método se lleva a cabo en un punto de venta.

20. El método de las reivindicaciones 5, 6, 12 o 13, en donde el método se lleva a cabo en un punto de uso.

21. El método de las reivindicaciones 5, 6, 12 o 13, en donde el método es controlado por un computador.

22. El método de las reivindicaciones 5, 6, 12 o 13, que comprende adicionalmente la etapa de suministrar por lo menos un aditivo seleccionado

a partir del grupo que consiste de un pegador y un plastificador.

23. Un conjunto de premezclas fluidas diferentes, pero mutuamente compatibles, suficiente para formar por lo menos una línea calafateadora, dicho conjunto comprende:

- (i) por lo menos una premezcla aglomerante que comprende por lo menos un aglomerante polimérico que tiene un Tg menor a 0° C;
- (ii) por lo menos una premezcla aglomerante que comprende por lo menos un aglomerante polimérico que tiene un Tg menor a 25° C; y
- (iii) opcionalmente por lo menos una premezcla extendedora que comprende por lo menos un extendedor.

24. El conjunto de premezclas de la reivindicación 23, dicho conjunto comprende adicionalmente por lo menos una premezcla aglomerante fluida

adicional o una premezcla extendedora fluida adicional.

25. El conjunto de premezclas de la reivindicación 24, en donde la premezcla extendedor afluida adicionalmente comprende por lo menos un pigmento opacificante.

26. El conjunto de premezclas de la reivindicación 23, que comprende adicionalmente por lo menos una premezcla opacificante fluida que comprende por lo menos un pigmento opacificante.

27. Un método para formar por lo menos una línea de calafateadores, dicho método comprende las etapas de:

- (a) suministrar el conjunto de premezclas de las reivindicaciones 23, 24, 25 o 26; y
- (b) dispensar una cantidad predeterminada de cada una de las premezclas seleccionadas en contenedores o aplicadores para formar una línea de calafateadores.

RESUMEN

Se suministra un conjunto de premezclas fluidas útiles para adhesivos y calafateadores. También se suministran métodos para proveer líneas de adhesivo y de calafateadores usando los conjuntos de las premezclas. Adicionalmente se suministran rangos de adhesivos y calafateadores con base en las líneas de adhesivo y calafateadores. Utilizando estos métodos el fabricante, vendedor, o usuario puede ajustar el adhesivo o calafateador al punto de fábrica, venta, o uso para adecuar el proceso o las condiciones de su uso final.

64 63

APOSTILLE

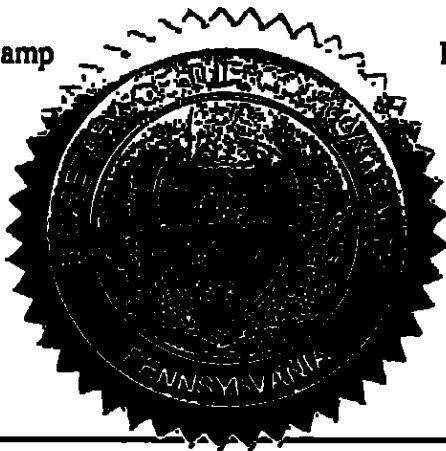
(Convention de La Haye du 5 octobre 1961)

1. Country: United States of America
2. This public document has been signed by Catherine B. Boccuti
3. acting in the capacity of Notary Public, Montgomery County
4. bears the seal/stamp Catherine B. Boccuti, Notary Public, Commonwealth of Pennsylvania

Certified

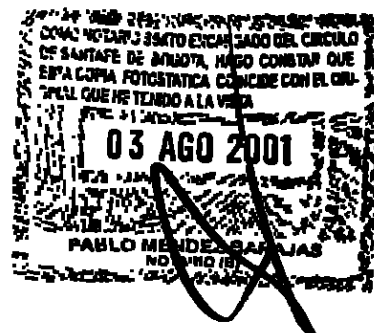
5. at Harrisburg, Pennsylvania
6. The 19th day of July, 2001
7. by Kim Pizzigrilli, Secretary of the Commonwealth of Pennsylvania
8. No. 0117701

9. Seal/Stamp



10. Signature:

Kim Pizzigrilli
Kim Pizzigrilli



Representación y Poder con autenticación notarial y Apostille para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, nombres de dominio, lemas comerciales, licencias.

Representation and Power-of-Attorney with notarial authentication and Apostille for patents, utility models, industrial designs, trademarks, commercial names, trade emblems, domain names, slogans, licenses.

REPRESENTACION Y PODER

REPRESENTATION AND POWER-OF-ATTORNEY

Yo (nosotros), abajo firmado (s)/I (we), the undersigned

John Michael FRIEL

domiciliado (s) en/or 341 Beech Street,

Warminster, PA 18974, United States
of America,

por el presente nombramos a EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 y GERMAN CAVELIER, tpa. 832, domiciliados en la Carrera 4a N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el parágrafo 1o del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como mis (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplentes, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, nombres de dominio, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa y judicial, nulidad, medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso administrativos relacionados con

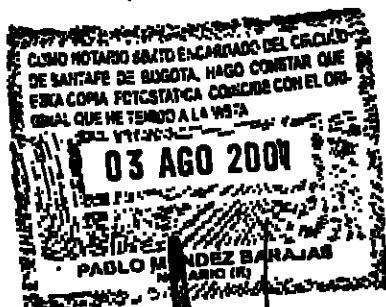
in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 and GERMAN CAVELIER, tpa. 832, domiciled at Carrera 4a N° 72 35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate depending on case, and the mere fact or its exercise will suffice. The exercise of the representation by the first, second or third alternates in their turn shall end at such time. In addition, we grant a Power of Attorney in favor of the above named attorneys at law to obtain the protection of my (our) industrial property against unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons whatsoever without jurisdiction, specially those administrative, administrative contentious and judicial, as well as before Arbitration Courts, in all matters concerning the following: a) Obtainment of patent, utility models and industrial designs; the registration of trademarks, collective, defensive and service marks, slogans, commercial names, trade emblems, domain names, vegetal varieties and denominations of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of unfair competition, protection to the consumer, oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus, the protection of trade secrets, and in general the civil, penal, and administrative suits relating to those rights; actions and suits

estos derechos; acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistir, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos.

instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney.

Dado y firmado hoy/Given and signed this June 1, 2001
en/in Montgomery County, PA
por/by JOHN MICHAEL FRIEL

Firma John Michael Friel Signature



CERTIFICADO NOTARIAL (INDIVIDUO)

NOTARIAL CERTIFICATE (INDIVIDUAL)

65
66

A los _____ días del mes de _____
de 200 _____ ante mí, Notario Público o Funcionario Autorizado
de _____

compareció(eron) personalmente _____

John Michael FRIEL

a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo

Notario Público o Funcionario Autorizado

On this 1 day of June
200 1 before me, a Notary Public or Attesting Official of
Montgomery County, PA
personally appeared John Michael FRIEL

to me known, and known to me to be the person(s) who
executed that foregoing document, and who has(have) legal

capacity to execute it.
Notary Seal
Catherine B. Boccuti, Notary Public
Lower Gwynedd Twp., Montgomery County
My Commission Expires Nov. 12, 2002

Notary Public or Attesting Official Catherine Boccuti

CERTIFICADO NOTARIAL (SOCIEDAD)

NOTARIAL CERTIFICATE (CORPORATION)

Hoy _____ de _____ de 200 _____
Compareció(eron) ante mí

On this _____ day of _____ 200 _____
appeared before me

quien(es) conozco personalmente y que firma(n) este
documento en representación de la Sociedad/compañía
denominada _____

who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company named _____

Certifico:

I certify:

1. Que he visto los siguientes documentos:*

1. That I have seen the following documents:*

2. Que dichos documentos prueban lo siguiente:

2. That the above documents duly prove the following:

2.1. Que _____

2.1. That _____

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de _____

is a Corporation/Company legally constituted and in existence
in accordance with the laws _____

2.2. Que el domicilio de dicha Sociedad/Compañía es _____

2.2. That the domicile of said Corporation/Company is _____

2.3. Que el objeto u objetos para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.3. That the purpose or purposes for which the present Power
of Attorney is granted are, and are intended to be, the corporation
purposes set forth in the _____ of the mentioned
Corporation/Company.

2.4. Que el(los) Sr.(Sres.) _____

2.4. That Mr.(Messrs.) _____

está(n) autorizado(s) para otorgar el presente Poder.

is(are) authorized to grant the present Power of Attorney.

Ciudad _____

City _____

Estado _____

State _____

Hoy _____ de 200 _____

This _____ day of _____ 200 _____

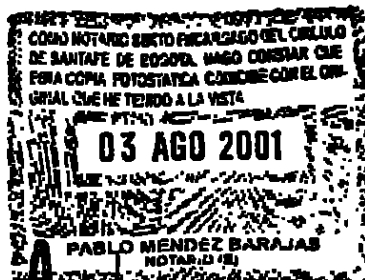
Notario Público o Funcionario Autorizado -- Notary Public or Attesting Official

* Los documentos deben identificarse con fecha y origen

* Documents must be identified with date and origin

12698-801-001-6
12698-801-001-5
12697-801-001-8
12695-801-001-2
12693-801-001-7

APOSTILLE	
(Convention de La Haye du 5 octobre 1961)	
1. Country:	
This public document	
2. has been signed by	
3. acting in the capacity of	
4. bears the seal/stamp of	
Certified	
5. at	6. the
7. by	
8. No.	
9. Seal/stamp	10. Signature
.....	



[Handwritten signature]

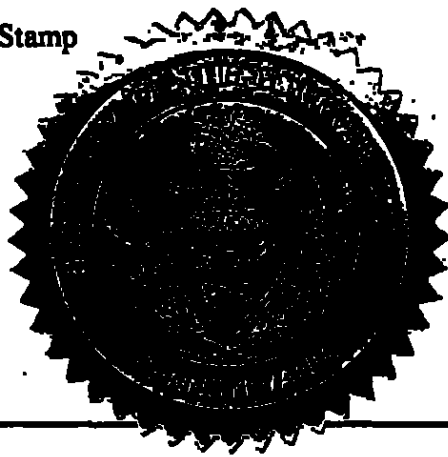
APOSTILLE

(Convention de La Haye du 5 octobre 1961)

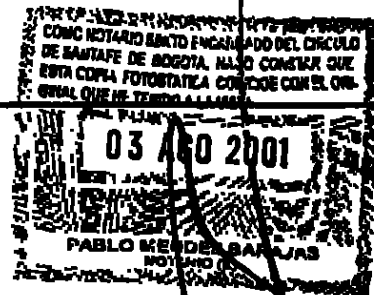
1. Country: United States of America
2. This public document has been signed by Catherine B. Boccuti
3. acting in the capacity of Notary Public, Montgomery County
4. bears the seal/stamp Catherine B. Boccuti, Notary Public, Commonwealth of Pennsylvania

Certified

5. at Harrisburg, Pennsylvania
6. The 19th day of July, 2001
7. by Kim Pizzigrilli, Secretary of the Commonwealth of Pennsylvania
8. No. 0117702
9. Seal/Stamp
10. Signature:



Kim Pizzigrilli
Kim Pizzigrilli



Representación y Poder con autenticación notarial y Apostille para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, nombres de dominio, lemas comerciales, licencias.

Representation and Power-of-Attorney with notarial authentication and Apostille for patents, utility models, industrial designs, trademarks, commercial names, trade emblems, domain names, slogans, licenses.

REPRESENTACION Y PODER

REPRESENTATION AND POWER-OF-ATTORNEY

Yo (nosotros), abajo firmado (s)/I (we), the undersigned

John William HOOK III

domiciliado (s) en/or 410 Twin Streams Drive,
Warminster, PA 18794, United States
of America,

por el presente nombramos a EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 y GERMAN CAVELIER, tpa. 832, domiciliados en la Carrera 4a N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el párrafo 1o del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como mis (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplentes, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

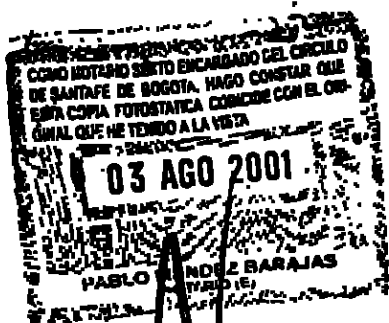
Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, nombres de dominio, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa y judicial, nulidad, medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso administrativos relacionados con

in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 and GERMAN CAVELIER, tpa. 832, domiciled at Carrera 4a N° 72 35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate, depending on the case, and the mere fact or its exercise shall not constitute a permanent representation by the first, second or third alternate in their turn shall end at such time. In addition, we grant a Power-of-Attorney in favor of the above named attorneys at law so that they may obtain the protection of my (our) industrial property and against the unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative contentious and judicial, as well as before Arbitration Court, in all matters concerning the following: a) Obtainment of patents, utility models and industrial designs; the registration of trademarks, collective, defensive and service marks, slogans, commercial names, trade emblems, domain names, vegetal varieties and denominations of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of unfair competition, protection to the consumer, oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus, the protection of trade secrets, and in general the civil, penal and administrative suits relating to those rights; actions and suits

estos derechos; acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistir, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos.

instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney.

Dado y firmado hoy/Given and signed this June 1, 2001
en/in Montgomery County, PA
por/by John William Hook, III
Firma John William Hook Signature



CERTIFICADO NOTARIAL (INDIVIDUO)

A los _____ días del mes de _____
de 200__ ante mí, Notario Público o Funcionario Autorizado
de _____
compareció(eron) personalmente _____
John William HOOK III

a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo

Notario Público o Funcionario Autorizado – Notary Public or Attesting Official *Charles B. Brown*

CERTIFICADO NOTARIAL (SOCIEDAD)

Hoy _____ de _____ de 200__
Compareció(eron) ante mí

quien(es) conozco personalmente y que firma(n) este
documento en representación de la Sociedad/compañía
denominada _____

Certifico:

1. Que he visto los siguientes documentos:*

2. Que dichos documentos prueban lo siguiente:

2.1. Que _____

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de _____

2.2. Que el domicilio de dicha Sociedad/Compañía es _____

2.3. Que el objeto u objetos para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.4. Que el(los) Sr.(Sres.) _____

está(n) autorizado(s) para otorgar el presente Poder.

Ciudad _____

Estado _____

Hoy _____ de 200__

Notario Público o Funcionario Autorizado – Notary Public or Attesting Official _____

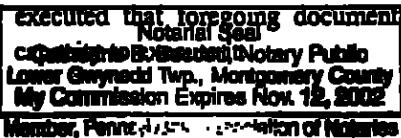
* Los documentos deben identificarse con fecha y origen

CAVELIER ABOGADOS
WPP0DE01-181 (MINUTA N°12.1.1.2.6 USA)

NOTARIAL CERTIFICATE (INDIVIDUAL)

On this 1 day of June
200 / before me, a Notary Public or Attesting Official of
Montgomery County, PA
personally appeared _____
John William HOOK III

to me known, and known to me to be the person(s) who
executed that foregoing document and who has(have) legal



Notary Public or Attesting Official *Charles B. Brown*

NOTARIAL CERTIFICATE (CORPORATION)

On this _____ day of _____ 200__
appeared before me

who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company named _____

I certify:

1. That I have seen the following documents:*

2. That the above documents duly prove the following:

2.1. That _____

is a Corporation/Company legally constituted and in existence
in accordance with the laws _____

2.2. That the domicile of said Corporation/Company is _____

2.3. That the purpose for which the present Power
of Attorney is granted is _____ within the Corporation
purposes set forth in _____ the mentioned
Corporation/Company.

2.4. That Mr.(Messrs.) _____

is(are) authorized to grant the present Power of Attorney.

City _____

State _____

This _____ day of _____ 200__

* Documents must be identified with date and origin

11078-801-001-6
12697-801-001-8
12695-801-001-2
12693-801-001-7

APOSTILLE	
(Convention de La Haye du 5 octobre 1961)	
1. Country:	
This public document	
2. has been signed by	
3. acting in the capacity of	
4. bears the seal/stamp of	
Certified	
5. at	6. the
7. by	
8. No.	
9. Seal/stamp	10. Signature
.....	



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APOSTILLE

(Convention de La Haye du 5 octobre 1961)

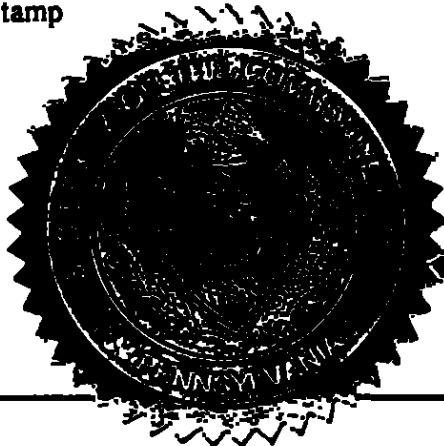
1. Country: United States of America
2. This public document has been signed by Catherine B. Boccuti
3. acting in the capacity of Notary Public, Montgomery County
4. bears the seal/stamp Catherine B. Boccuti, Notary Public, Commonwealth of Pennsylvania

Certified

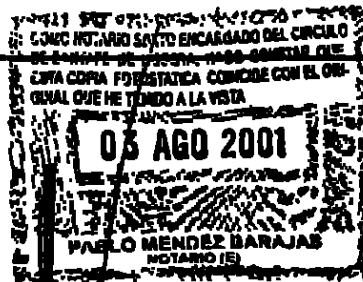
5. at Harrisburg, Pennsylvania
6. The 19th day of July, 2001
7. by Kim Pizzingrilli, Secretary of the Commonwealth of Pennsylvania
8. No. 0117723

9. Seal/Stamp

10. Signature:



Kim Pizzingrilli
Kim Pizzingrilli



Representación y Poder con autenticación notarial y Apostille para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, nombres de dominio, lemas comerciales, licencias.

Representation and Power-of-Attorney with notarial authentication and Apostille for patents, utility models, industrial designs, trademarks, commercial names, trade emblems, domain names, slogans, licenses.

REPRESENTACION Y PODER

REPRESENTATION AND POWER-OF-ATTORNEY

Yo (nosotros), abajo firmado (s)/I (we), the undersigned

Jerry William WASHEL

domiciliado (s) en/or 594 Quarry Road,
Harleysville, PA 19438, United States
of America,

por el presente nombramos a EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 y GERMAN CAVELIER, tpa. 832, domiciliados en la Carrera 4a N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el párrafo 1o del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como mis (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplentes, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, nombres de dominio, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación-voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa y judicial, nulidad, medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso administrativos relacionados con

in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 and GERMAN CAVELIER, tpa. 832, domiciled at Carrera 4a N° 72 35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate depending on case, and the mere fact or its exercise will suffice. The exercise of the representation by the first, second or third alternates in their turn shall end at such time. In addition, we grant to the above named attorneys at law the power to obtain the protection of my (our) industrial property and against the unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative contentious and judicial, as well as before Arbitration Court, in all matters concerning the following: a) Obtainment of patents, utility models and industrial designs; the registration of trademarks, collective, defensive and service marks, slogans, commercial names, trade emblems, domain names, vegetal varieties and denominations of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of unfair competition, protection to the consumer, oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus, the protection of trade secrets, and in general the civil, penal, and administrative suits relating to those rights; actions and suits

estos derechos; acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistir, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos.

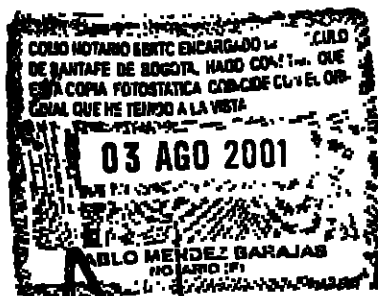
instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney.

Dado y firmado hoy/Given and signed this June 4, 2001

en/m Montgomery County, PA

por/by Terry William Winkler

Firma Terry William Winkler Signature



CERTIFICADO NOTARIAL (INDIVIDUO)

A los _____ días del mes de _____
de 200__ ante mí, Notario Público o Funcionario Autorizado
de _____
compareció(eron) personalmente _____
Jerry William WASHEL
a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo

Notario Público o Funcionario Autorizado -- Notary Public or Attesting Official

CERTIFICADO NOTARIAL (SOCIEDAD)

Hoy _____ de _____ de 200__
Compareció(eron) ante mí _____
quien(es) conozco personalmente y que firma(n) este
documento en representación de la Sociedad/compañía
denominada _____

Certifico:

1. Que he visto los siguientes documentos:*

2. Que dichos documentos prueban lo siguiente:

2.1. Que _____

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de _____

2.2. Que el domicilio de dicha Sociedad/Compañía es _____

2.3. Que el objeto u objetos para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.4. Que el(los) Sr.(Sres.) _____

está(n) autorizado(s) para otorgar el presente Poder.

Ciudad _____

Estado _____

Hoy _____ de 200__

Notario Público o Funcionario Autorizado -- Notary Public or Attesting Official

* Los documentos deben identificarse con fecha y origen

NOTARIAL CERTIFICATE (INDIVIDUAL)

On this 4 day of June
200__ before me, a Notary Public or Attesting Official of
Montgomery County PA
personally appeared _____
Jerry William WASHEL
to me known, and known to me to be the person(s) who
executed that foregoing document, and who has(have) legal

Notarial Seal
Catherine B. Bocchi, Notary Public
Lower Merion Twp., Montgomery County
My Commission Expires Nov. 12, 2002
Member, Pennsylvania Association of Notaries

Notary Public or Attesting Official Catherine Bocchi

NOTARIAL CERTIFICATE (CORPORATION)

On this _____ day of _____ 200__
appeared before me _____
who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company named _____

I certify:

1. That I have seen the following documents:*

2. That the above documents duly prove the following:

2.1. That _____

is a Corporation/Company legally constituted and in existence
in accordance with the laws _____

2.2. That the domicile of said Corporation/Company is _____

2.3. That the purpose or purposes for which the present Power
of Attorney is granted are comprised within the corporation
purposes set forth in the Charter of the mentioned
Corporation/Company.

2.4. That Mr.(Messrs.) _____

is(are) authorized to grant the present Power of Attorney.

City _____

State _____

This _____ day of _____ 200__

03 AGO 2001
PABLO MENDEZ BARAJAS
NOTARIO (B)
JEROME

* Documents must be identified with date and origin

12698-801-001-6
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12697-801-001-8

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12693-801-001-7

APOSTILLE

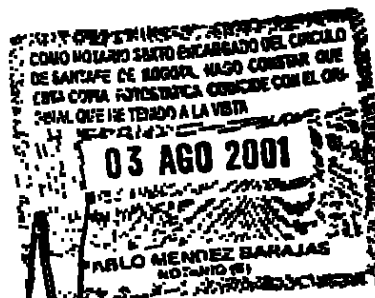
(Convention de La Haye du 5 octobre 1961)

1. Country:
This public document
2. has been signed by
3. acting in the capacity of
4. bears the seal/stamp of

Certified

5. at 6. the
7. by
8. No.
9. Seal/stamp 10. Signature

.....



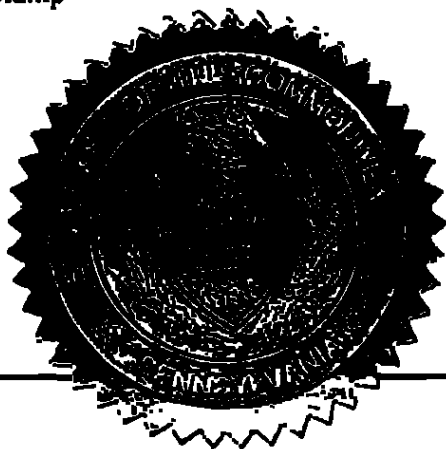
APOSTILLE

(Convention de La Haye du 5 octobre 1961)

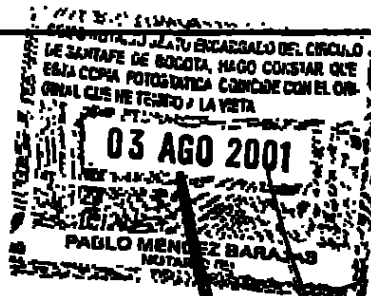
1. Country: United States of America
2. This public document has been signed by Catherine B. Boccuti
3. acting in the capacity of Notary Public, Montgomery County
4. bears the seal/stamp Catherine B. Boccuti, Notary Public, Commonwealth of Pennsylvania

Certified

5. at Harrisburg, Pennsylvania
6. The 19th day of July, 2001
7. by Kim Pizzigrilli, Secretary of the Commonwealth of Pennsylvania
8. No. 0117727
9. Seal/Stamp
10. Signature:



Kim Pizzigrilli
Kim Pizzigrilli



Representación y Poder con autenticación notarial y Apostille para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, nombres de dominio, lemas comerciales, licencias.

Representation and Power-of-Attorney with notarial authentication and Apostille for patents, utility models, industrial designs, trademarks, commercial names, trade emblems, domain names, slogans, licenses.

REPRESENTACION Y PODER

REPRESENTATION AND POWER-OF-ATTORNEY

Yo (nosotros), abajo firmado (s)/I (we), the undersigned
Dennis Paul LORAH

domiciliado (s) en/or 1962 Heebner Way
Lansdale, PA 19446, United States of
America,

por el presente nombramos a EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 y GERMAN CAVELIER, tpa. 832, domiciliados en la Carrera 4a N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el párrafo 1o del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como mis (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplentes, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

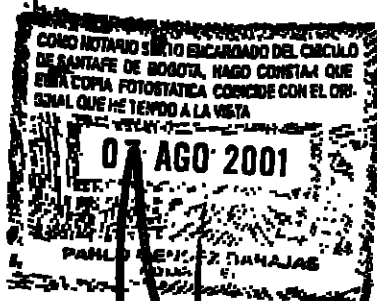
Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, nombres de dominio, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación-voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa y judicial, nulidad, medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso administrativos relacionados con

in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 and GERMAN CAVELIER, tpa. 832, domiciled at Carrera 4a N° 72 35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate depending on case, and the mere fact or its exercise will suffice. The exercise of the representation by the first, second or third alternates in their turn shall end at such time. In addition, we grant a power of attorney in favor of the above named attorneys at law to obtain the protection of my (our) industrial property and against the unfair competition, for which purpose I (we) authorize the said attorneys to represent me (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative-contentious and judicial, as well as before Arbitration Court, in all matters concerning the following: a) Obtainment of patents utility models and industrial designs; the registration of trademarks, collective, defensive and service marks; slogans, commercial names, trade emblems, domain names, vegetal varieties and denomination of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of unfair competition, protection to the consumer, oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus, the protection of trade secrets, and in general the civil, penal, and administrative suits relating to those rights; actions and suits

estos derechos, acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistir, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos.

instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney.

Dado y firmado hoy/Given and signed this June 1, 2001
en/in Montgomery County, PA, USA
por/by Dennis Paul Lorah
Firma Dennis Paul Lorah Signature



CERTIFICADO NOTARIAL (INDIVIDUO)

NOTARIAL CERTIFICATE (INDIVIDUAL)

A los _____ días del mes de _____
de 200 _____ ante mí, Notario Público o Funcionario Autorizado
de _____
compareció(eron) personalmente _____
Dennis Paul LORAH
a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo

On this _____ day of _____
200 / before me, a Notary Public or Attesting Official of _____
Montgomery County, PA
personally appeared _____
Dennis Paul LORAH
to me known, and known to me to be the person(s) who
executed that foregoing document, and who has(have) legal
capacity to execute it

Notarial Seal
Catherine B. Boccia, Notary Public
Lower Gwynedd Twp., Montgomery County
My Commission Expires Nov. 12, 2002
Member, Pennsylvania Notary Association

Notario Público o Funcionario Autorizado _____ **Catherine B. Boccia**

CERTIFICADO NOTARIAL (SOCIEDAD)

NOTARIAL CERTIFICATE (CORPORATION)

Hoy _____ de _____ de 200 _____
Compareció(eron) ante mí _____
quien(es) conozco personalmente y que firma(n) este
documento en representación de la Sociedad/compañía
denominada _____

On this _____ day of _____ 200 _____
appeared before me _____
who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company named _____

Certifico:

I certify:

1. Que he visto los siguientes documentos:*

1. That I have seen the following documents:*

2. Que dichos documentos prueban lo siguiente:

2. That the above documents duly prove the following:

2.1. Que _____

2.1. That _____

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de _____

is a Corporation/Company legally constituted and in existence
in accordance with the laws _____

2.2. Que el domicilio de dicha Sociedad/Compañía es _____

2.2. That the domicile of said Corporation/Company is _____

2.3. Que el objeto u objetos para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.3. That the purpose or purposes for which the present Power
of Attorney is being granted are within the corporation
purposes set forth in the charter of the mentioned
Corporation/Company. **03 AGO 2001**

2.4. Que el(los) Sr.(Sres.) _____

2.4. That Mr.(Messrs.) _____

está(n) autorizado(s) para otorgar el presente Poder.

is(are) authorized to grant the present Power of Attorney.

Ciudad _____

City _____

Estado _____

State _____

Hoy _____ de 200 _____

This _____ day of _____ 200 _____

Notario Público o Funcionario Autorizado – Notary Public or Attesting Official _____

* Los documentos deben identificarse con fecha y origen

* Documents must be identified with date and origin

12693 - 801-001-6
12697 - 801-001-3
12675 - 801-001-7

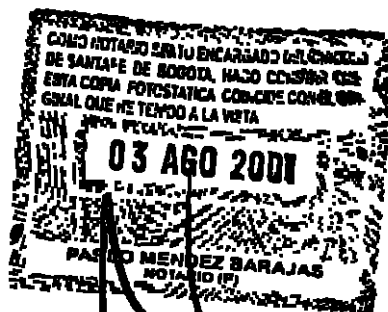
APOSTILLE

(Convention de La Haye du 5 octobre 1961)

1. Country:
This public document
2. has been signed by
3. acting in the capacity of
4. bears the seal/stamp of

Certified

5. at 6. the
7. by
8. No.
9. Seal/stamp 10. Signature



75/76

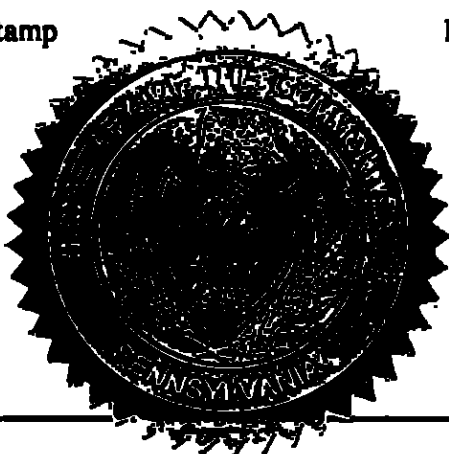
APOSTILLE

(Convention de La Haye du 5 octobre 1961)

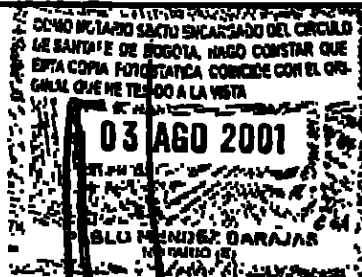
1. Country: United States of America
2. This public document has been signed by Catherine B. Boccuti
3. acting in the capacity of Notary Public, Montgomery County
4. bears the seal/stamp Catherine B. Boccuti, Notary Public, Commonwealth of Pennsylvania

Certified

5. at Harrisburg, Pennsylvania
6. The 19th day of July, 2001
7. by Kim Pizzingrilli, Secretary of the Commonwealth of Pennsylvania
8. No. 0117732
9. Seal/Stamp
10. Signature:



Kim Pizzingrilli
Kim Pizzingrilli



Representación y Poder con autenticación notarial y Apostille para patentes, modelos de utilidad, diseños industriales, marcas de fábrica, nombres comerciales, enseñas, nombres de dominio, lemas comerciales, licencias.

Representation and Power-of-Attorney with notarial authentication and Apostille for patents, utility models, industrial designs, trademarks, commercial names, trade emblems, domain names, slogans, licenses.

REPRESENTACION Y PODER

REPRESENTATION AND POWER-OF-ATTORNEY

Yo (nosotros), abajo firmado (s)/I (we), the undersigned

James Alexander COSTANZO

domiciliado (s) en/or **1518 Evans Road,**

Ambler, PA 19002, United States of America,

por el presente nombramos a EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 y GERMAN CAVELIER, tpa. 832, domiciliados en la Carrera 4a N° 72-35, Bogotá, Colombia, en obediencia a lo dispuesto en el parágrafo 1o del Artículo 543 del Código de Comercio, el primero como principal y los demás como suplentes, en su orden, como mis (nuestros) representantes en todos los asuntos de propiedad industrial con facultad para recibir notificaciones y nombrar apoderados judiciales o extrajudiciales. El primer representante suplente reemplazará al principal en caso de ausencia o impedimento temporal o definitivo de aquél. La misma regla se aplicará cuando el segundo representante suplente haya de reemplazar al primero, o el tercero al segundo. En tales casos, el representante principal, o el primero, o segundo suplente, en su caso, o ambos, declararán su intención de no ejercer la representación mediante declaración autenticada por Notario Público en Colombia, o por Notario u otro Funcionario Público, o Cónsul de Colombia, en el extranjero; y si se tratare de impedimento, con el certificado respectivo. Si alguno de los nombrados faltare definitivamente, el siguiente tomará su lugar. Cuando cesare la ausencia o impedimento del representante principal, o de su primero o segundo suplentes, en su caso, podrán ejercer la representación, en su orden, uno u otros según el caso, asumiéndola por el solo hecho de ejercerla, cesando en ese momento el ejercicio de la representación por el primero, segundo o tercer suplente en su caso.

Además, confiero (conferimos) poder a los abogados arriba nombrados, para obtener la protección de mi (nuestra) propiedad industrial y contra la competencia desleal, a cuyo efecto autorizo (amos) a los dichos apoderados para que me (nos) representen ante cualesquiera entidades o personas, ejerzan o no jurisdicción, especialmente ante las del orden administrativo, contencioso-administrativo y judicial, así como los tribunales de arbitramento, en todo lo concerniente a los siguientes asuntos: a) Obtención de patentes de invención, modelos de utilidad y diseños industriales; el registro de marcas de fábrica, colectivas, defensivas, de servicio, lemas comerciales, nombres comerciales, enseñas, nombres de dominio, variedades vegetales y denominaciones de origen; su renovación, traspaso, cambio de nombre o domicilio, cancelación voluntaria; y el registro de licencias de uso de esos derechos; b) Las acciones de competencia desleal, protección del consumidor, oposiciones u observaciones, cancelación administrativa y judicial, nulidad, medidas cautelares, concesión de licencias, la tutela, la protección de secretos industriales, y en general los juicios civiles, penales, administrativos o contencioso-administrativos relacionados con

in due compliance with the terms of paragraph 1st. of article 543 of the Commercial Code, do hereby appoint EMILIO FERRERO, tpa. 31929; GONZALO PERDOMO, tpa. 831; LUZ CLEMENCIA DE PAEZ, tpa. 23555 and GERMAN CAVELIER, tpa. 832, domiciled at Carrera 4a N° 72 35, Bogotá, Colombia, the first as principal and the others as alternates, in the order of their appointment, as our representatives for all industrial property matters with faculty to receive notifications and to appoint attorneys in and out of Court. The first alternate shall replace the principal in case of his absence or of temporal or definitive impediment. The same rule will apply when the second alternate representative is to replace the first one, or when the third is to replace the first or second alternates in their turn, or both of them, second. In such cases, the principal representative, or the first or second alternates in their turn, or both of them, shall state their intention not to act as representatives through a declaration given before a Notary Public in Colombia, or before a Notary or another Public Official or a Colombian Consul abroad; and in case of impediment, the appropriate certificate shall suffice. If any of the appointees were to be definitely absent, the following alternate shall take his place. When the absence or impediment of the principal representative, or of the first or second alternate in their turn ceases, the representation can be taken again in their sequence, by the principal, the first or second alternate depending on case, and the mere fact or its exercise will suffice. The exercise of the representation by the first, second or third alternates in their turn shall end at such time. In addition, we grant a Power of Attorney to the above named attorneys at law to represent me (us) in the protection of my (our) industrial property and against unfair competition, for which purpose I (we) authorize the said attorneys (us) before any authorities or persons, with or without jurisdiction, specially those administrative, administrative and judicial, as well as before Arbitration Court, in all matters concerning the following: a) Obtainment of patents, utility models and industrial designs; the registration of trademarks, collective, defensive and service marks, slogans, commercial names, trade emblems, domain names, vegetal varieties and denominations of origin; its renewal, assignment, change of name or domicile, voluntary cancellation; and the registration of licenses of use of the above rights; b) Actions of unfair competition, protection to the consumer, oppositions or observations, administrative or Court cancellation, nullity, infringement, granting of licenses, the action for writ mandamus, the protection of trade secrets, and in general the civil, penal, and administrative suits relating to those rights; actions and suits

estos derechos, acciones y procesos que promovamos o se nos promuevan. Y para que en todos los asuntos arriba determinados, puedan sustituir este mandato, transigir, conciliar, admitir los hechos del proceso, desistir, cancelar, recibir, renunciar, y ratificar los actos de agentes oficiosos.

instituted by me (us) or against me (us). And that in all the above matters they may substitute this Power of Attorney, compromise, conciliate, admit the facts of the case, desist, cancel, receive, resign, and ratify acts done by representatives without a power of attorney.

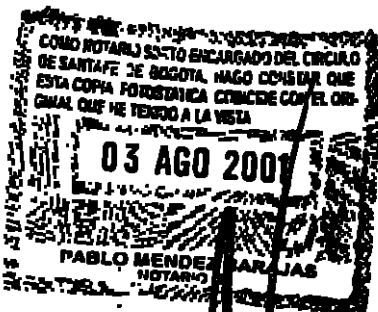
Dado y firmado hoy/Given and signed this

en/in Spring House, Pennsylvania, USA

por/by James Alexander Costanzo

Firma

James Alexander Costanzo Signature
June 18, 2001



CERTIFICADO NOTARIAL (INDIVIDUO)

A los _____ días del mes de _____
de 200 _____ ante mí, Notario Público o Funcionario Autorizado
de _____
compareció(eron) personalmente _____
James Alexander COSTANZO

a quien(es) doy fe de conocer y me consta que es(son) la(s)
persona(s) firmante(s) del documento que precede, y quien(es)
tiene(n) capacidad legal para otorgarlo

Notario Público o Funcionario Autorizado – Notary Public or Attesting Official

CERTIFICADO NOTARIAL (SOCIEDAD)

Hoy _____ de _____ de 200 _____
Compareció(eron) ante mí

quien(es) conozco personalmente y que firma(n) este
documento en representación de la Sociedad/compañía
denominada _____

Certifico:

1. Que he visto los siguientes documentos:*

2. Que dichos documentos prueban lo siguiente:

2.1. Que _____

es una Sociedad/Compañía legalmente constituida y existente
de acuerdo con las leyes de _____

2.2. Que el domicilio de dicha Sociedad/Compañía es _____

2.3. Que el objeto u objetos para los cuales se otorga el presente
poder están comprendidos dentro del objeto social de la
mencionada Sociedad/Compañía.

2.4. Que el(los) Sr.(Sres.) _____

está(n) autorizado(s) para otorgar el presente Poder.

Ciudad _____

Estado _____

Hoy _____ de 200 _____

Notario Público o Funcionario Autorizado – Notary Public or Attesting Official

* Los documentos deben identificarse con fecha y origen

NOTARIAL CERTIFICATE (INDIVIDUAL)

On this 18TH day of June
200 1 before me, a Notary Public or Attesting Official of
Pennsylvania
personally appeared James Alexander COSTANZO

to me known, and known to me to be the person(s) who
executed the foregoing document, and who has(have) legal

PHYLIS B. WEAVER, Notary Public
Lower Gwynedd Twp., Montgomery Co.
My Commission Expires May 10, 2005

NOTARIAL CERTIFICATE (CORPORATION)

On this _____ day of _____ 200 _____
appeared before me

who(m) I know personally and who(m) signed this document as
representative(s) of the Corporation/Company named _____

I certify:

1. That I have seen the following documents:*

2. That the above documents duly prove the following:

2.1. That _____

is a Corporation/Company legally constituted and in existence
in accordance with the laws _____

2.2. That the domicile of said Corporation/Company is _____

2.3. That the purpose or purposes for which the present Power
of Attorney is granted are, for the corporation
purposes set forth in the charter of the mentioned
Corporation/Company.

2.4. That Mr.(Messrs.) _____

is(are) authorized to grant the present Power of Attorney.

City _____

State _____

This _____ day of _____ 200 _____

* Documents must be identified with date and origin

APOSTILLE
(Convention de La Haye du 5 octobre 1961)

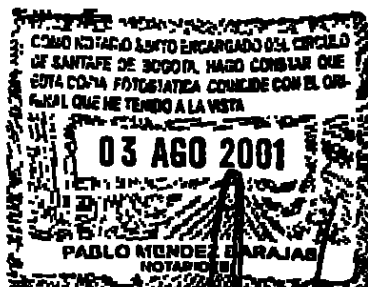
1. Country:
This public document

2. has been signed by
3. acting in the capacity of
4. bears the seal/stamp of

Certified

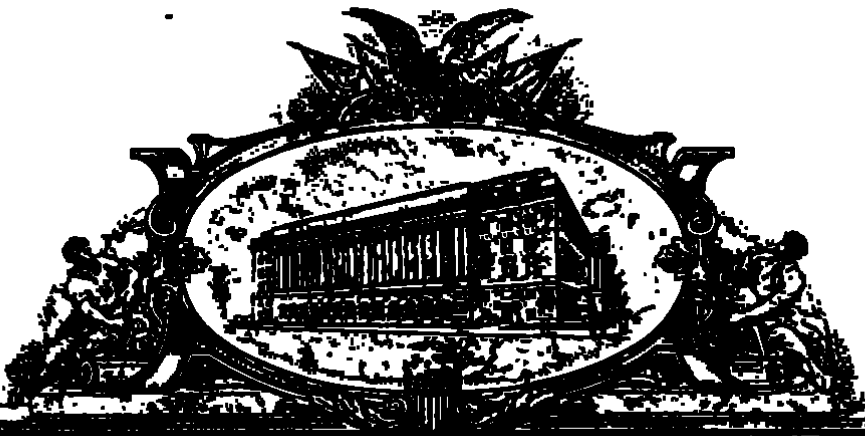
5. at 6. the
7. by
8. No.
9. Seal/stamp 10. Signature

.....



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DA 405139



THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

May 07, 2001

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 09/785,389

FILING DATE: February 16, 2001



By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

N. WOODSON

Certifying Officer

11065 U.S. PTO
02/16/01

02-20-01

CERTIFICATE OF EXPRESS MAILING
EXPRESS MAIL, Mailing Label Number EL47857671545
Date of Deposit 2/16/01
I hereby certify under 37 CFR 1.10 that this correspondence is being
deposited with the United States Postal Service as "Express Mail Post
Office to Addressee" with sufficient postage on the date indicated
above and is addressed to the Commissioner for patents, Washington
D.C. 20231
Name James Porter
Signature James Porter
Clifford Chance Rogers & Wells LLP

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Docket No. 6258-071

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

PATENT APPLICATION TRANSMITTAL

COMMISSIONER OF PATENTS
BOX PATENT APPLICATION
Washington, D.C. 20231

11065 U.S. PTO
09/785389
02/16/01

Sir:

Transmitted herewith for filing is a utility patent application

Of: John M. Friel et al.

For: PREMIXES AND METHOD OF PREPARING ADHESIVES AND CAULKS FROM
PREMIXES

ENCLOSED are the following:

1. ☒ Specification, abstract and claims (29 pages)
2. ☐ _____ sheets of ☐ formal ☐ informal drawings (Figs. _____)
Suggested Figure for Publication: _____
3. ☒ Declaration
☐ signed ☒ unsigned
☐ Copy from a prior application (for continuation/divisional)
4. ☐ Application Data Sheet
5. ☐ Preliminary Amendment
6. ☐ Information Disclosure Statement and PTO-1449
7. ☐ Assignment and Assignment Recordation sheet (*Fee calculated separately*)
8. ☐ The prior application is assigned to: _____
The assignment was recorded on _____ at reel _____ and frame _____.
☐ A copy of the assignment from the prior application is enclosed.
9. ☐ Non-Publication Request
10. ☐ Other:

NOTE the following:

11. ☐ This application is made under 37 C.F.R. § 1.53 (b) and is a
☐ Continuation ☐ Continuation-In-Part ☐ Divisional
of Prior Application No. _____ filed _____

NYD 1225993 1

09785389-021601

12. ☐ An Extension of time is filed concurrently herewith for the parent application.
13. Small Entity Status:
- ☐ Applicant is a small entity
- ☐ Small entity status claimed in the parent application is no longer proper
14. ☒ Applicants claim priority from the following applications(s) under 35 U.S.C. § 119:

Serial Number	Country	Filing Date	Certified Copy Recd.
60/183,655	US	2/18/00	
60/183,656	US	2/18/00	
60/247,639	US	11/10/00	

15. ☐ Cancel claims _____ prior to calculation of the filing fee.

FILING FEE: calculated below (after accounting for any preliminary amendment or claims cancellations if noted above):

Basic Filing Fee			\$710.00
Total No. Claims	Extra Claims(Total-20)	Fee / claim	
97	77	\$18.00	\$1,386.00
Total No. Independent Claims	Extra Independ.(No.-3)	Fee / claim	
6	3	\$80.00	\$240.00
Multiple dependent claim? + \$270			\$270.00
Sub-Total			\$2,606.00
TOTAL FEE DUE			\$2,606.00

16. ☐ A check in the amount of _____ is enclosed (must at least cover the basic fee).
- ☒ The Commissioner is authorized to charge \$2,606.00 in connection with this communication to Deposit Account No. 50-0521.

In the event that a petition for extension of time is required to be submitted in the pending prior application, and in the event that a separate petition for the pending prior application is not filed on even date, applicant hereby petitions under 37 C.F.R. 1.136(a) for an extension of time in the pending prior application of as many months as are required to render this submission timely. The Commissioner is authorized to charge any fees due in connection with such a petition to Deposit Account No. 50-0521.

The Commissioner is authorized to charge any fee or additional fee due in connection with this communication to Deposit Account No. 50-0521.

A duplicate copy of this sheet is enclosed.

Respectfully submitted,

Date: February 15, 2001

Margaret B. Kelley
Margaret B. Kelley
Reg. No. 29,181

Clifford Chance Rogers & Wells LLP
200 Park Avenue
New York, NY 10166-0153
Telephone: (212) 878-3145

NY111225903 I

09785389-021601

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82

81

**APPLICATION
FOR
UNITED STATES LETTERS PATENT**

**TITLE: PREMIXES AND METHOD OF PREPARING ADHESIVES AND
 CAULKS FROM PREMIXES**

**APPLICANTS: John M. Friel, John W. Hook III, Jerry W. Washel, Dennis
 P. Lorah and James A. Costanzo**

09785389-021601

"EXPRESS MAIL" Mailing Label Number <u>EL4785767155</u>	
Date of Deposit	<u>2/16/01</u>
I hereby certify under 37 CFR 1.10 that this correspondence is being deposited with the United States Postal Service as "Express Mail Post Office to Addressee" with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.	
<u>James Porter</u>	
<u>James Porter</u>	

83 / 82

6258-071

**PREMIXES AND METHOD OF PREPARING ADHESIVES
AND CAULKS FROM PREMIXES**

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to U.S. Provisional Applications Ser. Nos. 60/183,655 filed February 18, 2000, 60/183,656 filed February 18, 2000, and 60/247,639 filed November 10, 2000.

BACKGROUND OF THE INVENTION

Field of the Invention

This invention relates to sets of binder premixes methods of preparing adhesives and caulks from the sets of premixes, and to methods of preparing ranges of adhesives and caulks from sets of the premixes.

In co-pending U.S. Patent Applications Serial Nos. 60/183,655; 60/183,656; and 60/247,639; we describe preprints and method of making paints from these preprints employing delayed product differentiation. The use of sets of premixed ingredients or raw materials as described in these applications may be extended to the preparation of adhesives.

Adhesive formulating involves selecting and admixing appropriate adhesive ingredients in the correct proportions to provide an adhesive with specific processing and handling properties, as well as the desired final dry adhesive film properties. The major ingredients of many adhesives are the binder, optional tackifier, and a fluid medium if the formulation is not presented neat, the fluid medium is, water if the adhesive is a water-borne adhesive, or solvent if the adhesive is a solvent-borne adhesive. Common optional ingredients include defoamers, coalescents, plasticizers, thickeners, rheology modifiers, solvents, driers, anti-skinning agents, surfactants, mildewicides, biocides, crosslinkers, white opacifying pigments, extender pigments, colorants, and dispersants. After the fluid adhesive is formulated and applied to a surface, the adhesive dries by evaporation of the water and/or the solvent, with or without the application of heat or radiation,

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and the binder forms a film containing therein the pigment and the extender particles, if any.

Formulating adhesives is complex – it is not simply a matter of mixing a few ingredients in different ratios. Rather, it involves the selection and mixing of different ingredients in different ratios depending on the type of adhesive desired. This requires manufacturers to store many different ingredients and change ingredients during manufacture depending on the specific adhesive type being prepared.

Furthermore, it requires those involved in the supply chain, and in particular, adhesive retailers, to carry a large inventory of adhesives in order to offer a range of adhesives, such as various peel levels, viscosity levels, adhesion levels, removability levels and repositionability levels.

From the perspective of number of ingredients required, formulating an adhesive is less complex than formulating an architectural paint. However, the processing and end-use applications of an adhesive may involve a broader range of conditions than are typically experienced during the application of an architectural paint. For example, an adhesive may be applied at varying shear rates depending on the processing equipment used (for example, extrusion, gravure and mayer rod type applicators, roller and die coating, and the like) and used over a broad range of temperatures (for example, from less than 0°C in low-temperature or all-temperature applications to greater than 40°C in some packaging applications).

Therefore, it would be desirable to make adhesives, either at a relatively large-scale industrial plant or at a relatively smaller-scale, point-of-application, point-of-sale, or point-of-use location using a limited number of ingredients, to prepare all of these different adhesives, thus, minimizing the number and type of ingredients required to make a range of adhesives. Thus, it would be useful to have a system that would permit the manufacturer, seller, or user to adjust the adhesive at the point of manufacture, sale, or application, to suit the processing and end-use conditions.

SUMMARY OF THE INVENTION

The present invention provides sets of fluid premixes binder, one or more adhesive lines, and a range of adhesives. A "fluid," as used herein, means any material that flows, including liquids, flowable powders, and viscous, amorphous solids. As used herein, premixes are "mutually compatible" if the adhesives formed by admixing the premixes do not evidence signs of colloidal instability such as flocculation. Preferably, the adhesives formed from the premixes exhibit less than 5 grams of residue, such as gel and grit, per liter of adhesive when the adhesive is passed through a 325 mesh screen, more preferably less than 1 gram of residue per liter. Preferably, the premixes exhibit less than 5 grams of residue, such as gel and grit, per liter of premix when passed through a 325 mesh screen, more preferably less than 1 gram of residue per liter of premix. If the premixes and optional additives included to enhance specific adhesive properties are fully compatible, *i.e.*, they can be blended at any ratio without inducing colloidal instability, then they can be blended in any combination falling within the formulation space needed to achieve the desired property profile in the final adhesive. It is sufficient, however, if the premixes and optional additives can be blended at desired ratios without inducing colloidal instability to achieve the desired property profile in the range of adhesives. As used herein, "adhesive" is used in a broad sense to include all types of adhesives including neat, water-borne, and solvent-borne adhesives, including pressure sensitive adhesive and non-pressure sensitive adhesives. Pressure sensitive adhesives ("PSAs") that may be made by the method of the invention include any conventional PSAs including, without limitation, hot melt adhesives, solvent-based rubber adhesives, styrene-butadiene rubber emulsion adhesives, and acrylic adhesives. Such PSAs are employed in a number of applications, for example in tape and label applications. This definition of "adhesives" is intended to include products conventionally known as sealants, joint cements, plasters, pastes, ceramic tile adhesives, caulks, and like building adhesives.

An "adhesive line", as used herein, includes at least two different adhesives which offer properties which differ materially from each other in at least one

observable property, such as adhesion to certain substrates, viscosity, removability, and repositionability. Adhesive manufacturers and retailers typically offer a range of adhesives, the range including at least two adhesive lines. By "the range including at least two adhesive lines," as used herein, is meant that the discrete elected levels of the observable property defining a first adhesive line are combined with the discrete elected levels of the observable property defining a second adhesive line, etc. to define the adhesives in the range of adhesives. For example, preparing a range of adhesives including five adhesive lines may require preparing adhesives encompassing two peel levels, two viscosity levels, two adhesion levels, two removability levels, two repositionability levels, and preferably all combinations thereof. Thus, 32 different adhesive formulations ($2 \times 2 \times 2 \times 2 \times 2$) may be needed. Also encompassed, however, is a range of adhesives in which a certain number of adhesive lines or premixes, including up to as high as 10-60% of the total number, are omitted, for example, for commercial reasons or for stability reasons..

A set of different, but mutually compatible, fluid adhesive binder premixes, sufficient to formulate at least one adhesive line, comprises (a) at least one premix comprising at least one polymeric binder having a peel of less than about 20 ounces/inch, a tack of less than about 300 grams, and a shear of greater than about 50 hours; (b) at least one premix comprising at least one polymeric binder having a peel of less than about 20 to about 50 ounces/inch, a tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours, and (c) at least one premix comprising at least one polymeric binder having a peel of greater than about 50 ounces/inch, a tack of greater than about 500 grams, and a shear of less than about 10 hours. Preferably, the number of premixes is from 3 to 15.

The present invention also provides an adhesive composition which comprises the set of premixes as set forth above, and optionally at least one additional ingredient selected from the group consisting of a tackifier, a thickener, and a crosslinker.

Optionally, at least one of the premixes further comprises at least one optional additive selected from the group consisting of a tackifier, a plasticizer, a thickener and a crosslinker.

Also provided is a method of formulating at least one adhesive line, which method comprises the steps of:

- (a) selecting a set of different, but mutually compatible, fluid adhesive binder premixes, comprising:
 - (i) at least one premix comprising at least one polymeric binder having a peel of less than about 20 ounces/inch, a Polyken tack of less than about 300 grams and a shear of greater than about 50 hours; (ii) at least one premix comprising at least one polymeric binder having a peel of less than about 20 to about 50 ounces/inch, a Polyken tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours; and (iii) at least one premix comprising at least one polymeric binder having a peel of greater than about 50 ounces/inch, a Polyken tack of greater than about 500 grams, and a shear of less than about 10 hours; and
- (b) dispensing or predetermined amount of each of the premixes into containers or applicator[s] to form the adhesive line. Preferably, the number of premixes is from 3 to 15.

Further provided is a method of providing a range of adhesives, the range comprising at least two adhesive lines, which method comprises the steps of:

- (a) selecting a set of different, but mutually compatible, fluid adhesive binder premixes, which set comprises (i) at least one premix comprising at least one polymeric binder having a peel of less than about 20 ounces/inch, a Polyken tack of less than about 300 grams, and a shear of greater than about 50 hours, (ii) at least one premix comprising at least one polymeric binder having a peel of less than about 20 to about 50 ounces/inch, a Polyken tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours, (iii) at least one premix comprising at least one polymeric binder having a peel of greater than about 50 ounces/inch, a Polyken tack of greater than about 500 grams, and a shear of less than about 10

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hours; and (iv) at least one additional different premix selected from (i), (ii), or (iii); and

(b) dispensing a predetermined amount of each of the premixes into containers or applicator[s] to form the adhesive lines. Preferably, the number of premixes is from 4 to 15.

The methods herein may further comprise the step(s) of providing at least one tackifier, at least one thickener, at least one crosslinker, or combinations thereof. Predetermined amounts of the tackifier, the thickener, and or crosslinker are dispensed into containers or the applicator(s).

Also provided is a different set of premixes sufficient to form at least one different adhesive line, which set comprises at least two different, but mutually compatible, fluid adhesive binder premixes selected from the group consisting of (a) at least one premix comprising at least one curable prepolymer that forms a polymeric binder that has a Tg of about -70°C to about 0°C when cured; (b) at least one fluid premix comprising at least one curable prepolymer that forms a polymeric binder which has a Tg of about -10°C to about 70°C when cured; (c) at least one premix comprising at least one polymeric binder which has a Tg of about 0°C to about 30°C; (d) at least one premix comprising at least one polymeric binder which has a Tg of about -15°C to about 15°C; and (e) at least one premix comprising at least one polymeric binder which has a Tg of about -70°C to about 0°C.

Also provided is a method of providing at least one adhesive line, which method comprises the steps of (a) providing a set of different, but mutually compatible, fluid adhesive binder premixes comprising at least two premixes selected from the group consisting of (i) at least one premix comprising at least one curable prepolymer that has a Tg of about -70°C to about 0°C when cured; (ii) at least one premix comprising at least one curable prepolymer that has a Tg of about -10°C to about 70°C when cured; (iii) at least one premix comprising at least one polymeric binder having a Tg of about 0°C to about 30°C; (iv) at least one premix comprising at least one polymeric binder having a Tg of about -15°C to about 15°C; and (v) at least one premix comprising at least one polymeric binder having a

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Tg of about -70°C to about 0°C ; and (b) dispensing a predetermined amount of each of the premixes into containers or an applicator to form the one adhesive line.

Further provided is a method of providing a range of adhesives, the range comprising at least two adhesive lines, which method comprises the steps of:

- (a) providing a set of different, but mutually compatible, fluid adhesive binder premixes comprising at least three premixes selected from the group consisting of (i) at least one premix comprising at least one curable prepolymer that has a Tg of about -70°C to about 0°C when cured; (ii) at least one premix comprising at least one curable prepolymer that has a Tg of about -10°C to about 70°C when cured; (iii) at least one premix comprising at least one polymeric binder having a Tg of about 0°C to about 30°C ; (iv) at least one premix comprising at least one polymeric binder having a Tg of about -15°C to about 15°C ; (v) at least one premix comprising at least one polymeric binder having a Tg of about -70°C to about 0°C ; and (vi) at least one additional different premix selected from premixes (i), (ii), (iii), (iv), and (v); or (b) dispensing a predetermined amount of each of the premixes into containers or applicators to form the adhesive lines.

The methods herein may further comprising the step(s) of adding materials that enhance the application or final performance of the adhesive, such as tackifiers, plasticizers, thickeners, crosslinkers, and mixtures thereof.

Caulks are like adhesives and sealants in that they are based on soft polymers. Many caulks are also like paint in that they can be filled with pigment and extender. Caulks are differentiated by their higher solids content and higher viscosity and their use to fill and seal cracks, joints, and the like.

If one adhesive line is desired, *i.e.*, if one key property is to be varied (for example, peel, viscosity, adhesion, removability, or repositionability), then the complete adhesive line can be made from one each of premixes (i), (ii), and (iii) which are described above or alternatively from at least two of (a) to (e) which are described above.

If a range of adhesives including two adhesives lines is desired, *i.e.*, if two key properties are varied (for example, two properties selected from peel, viscosity,

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adhesion, removability, and repositionability), then the range of adhesives may be made from at least one each of premixes (i) to (iii) and least one additional, premixes but different selected from premixes (i) to (iii) or alternatively, from at least two of premixes (a) to (e) described above and at least one additional different premix selected from premixes (a) to (e) described above depending on which key properties are to be varied.

If a range of adhesives including three adhesive lines is desired, i.e., if three key properties are to be varied (for example, three properties selected from peel, viscosity, adhesion, removability, and repositionability), then the range of adhesives can be made from at least one each of premix (i), premix (ii), and premix (iii) and at least two additional different premixes selected from (i), (ii), or (iii) or alternatively at least one each of premixes (a) to (e) and at least two additional different premixes selected from (a) to (e), depending on which key properties are to be varied.

If a range of adhesives including four adhesive lines is desired, i.e., if four key properties are to be varied (for example, four properties selected from peel, viscosity, adhesion, removability and repositionability), then the range of adhesives can be made from at least one each of premix (i), premix (ii), and premix (iii) and at least three additional different premixes selected from (i) to (iii), depending on which key properties are to be varied.

This technique may be continued to vary as many additional key properties as desired.

By "additional premix selected from the group consisting of (i), (ii), and (iii)" is meant an adhesive binder premix which is different from adhesive premixes (i), (ii), or (iii), respectively, but which otherwise meets the limitations associated with premixes (i), (ii), and (iii). By "additional premixes selected from the group consisting of (a), (b), (c), (d), and (e)" is meant herein an adhesive binder premix different from premix (a), (b), (c), (d), or (e), respectively, but otherwise meeting the limitations associated with premix (a), (b), (c), (d) and (e).

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In each of the above embodiments, the premixes are selected to cover a wide formulation space so that the desired final adhesive properties lie within the blend space defined by the premixes at the extremes. In many cases, the premixes will not themselves be practical adhesives, but by pushing the premixes to these extremes one can maximize the blend space available for the adhesive system. When the premixes, additives, and colorants are all fully compatible, they can be blended at the desired ratios to achieve the desired adhesive line(s) and range of adhesives without inducing colloidal instability.

This technique is similar to the design principles used in statistical experimental design and analysis of mixture component designs; however, instead of designing a mixture space to explore the response surface within it, one is designing the boundaries of the mixture space to maximize the flexibility of the adhesive system. The key to success is to have mutual compatibility of the individual ingredients and premixes across the mixture space.

Adhesive properties can be predicted in a number of ways. One approach is to develop response surface models of the blend space using standard Mixture Component experimental design statistical tools. These simple statistical models can then be used by a linear optimization program, by a massive grid search, or by a graphical analysis tool. Another approach is to simply use empirical methods to determine which blends are needed for specific adhesive lines and then incorporate those simple empirical recipes in the adhesive-making machine software.

An extension of this techniques is to have the adhesive machine automatically pretest certain key properties (e.g., viscosity, adhesion to certain substrates, peel, tack, shear) and make minor adjustments during the formulating of the adhesives from the premixes. Having feedback loops in the adhesive machine can provide more precise matching of color, adhesion, peel strength, tack, shear strength, and viscosity targets.

It is preferred that the all fluid premixes employed herein have the same or similar viscosities to aid in mixing. Viscosity fluctuation in the final adhesive

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formulation is expected to be reduced because of the prior equilibration of ingredients in the premixes.

The premixes are formulated to maximize the flexibility of adhesive manufacturing. Rather than purchasing individual adhesive ingredients, adhesive manufacturers, and even buyers at point-of-sale and point-of-use (home improvement stores, building product departments, and contractors), can purchase the set of premixes needed to prepare a desired range of adhesives. These sets of premixes will contain at least one each of premixes (i), (ii) and (iii) and possibly additional premixes depending upon the formulating flexibility desired. Optionally, the above premixes are mixed with an additional premix which includes at least one colorant such as a colored pigment or dye.

The sets and methods of the invention can be used for caulks.

Binder selection is a major factor in producing a caulk that has the desired set of properties. Those skilled in the art readily recognize that binder characteristics such as solids level, monomer selection, molecular weight, Tg modules and many other factors influence the properties of the caulk. Those skilled in the art also qualitatively recognize how to control these characteristics to obtain the desired caulk properties. Such properties include the balance between tensile strength vs. elongation/flexibility, adhesion, surface tack, channel cracking, clarity, yellowing, shrinkage, and cost. While a quantitative relationship between binder characteristics and properties is difficult to obtain, those skilled in the art can readily select appropriate binders for use in the binder premixes to produce desired caulk properties.

In the caulk embodiment, the set comprises (a) at least one caulk binder premix comprising at least one polymeric binder which has a Tg of less than about 0°C; (b) at least one binder premix comprising at least one polymeric binder which has a Tg of less than about 25°C; and (c) optionally, at least one extender premix comprising at least one extender, wherein the premixes have a solids content of at least about 50% by weight.

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Also provided is a method of forming at least one caulk line, which method comprises the steps of:

- (a) providing a set of different, but mutually compatible, fluid-caulk binder premixes sufficient to form at least one caulk line, which set comprises (i) at least one binder premix comprising at least one polymeric binder which has a Tg of less than about 0°C; (ii) at least one binder premix comprising at least one polymeric binder which has a Tg of less than 25°C; and (iii) optionally, at least one extender premix comprising at least one extender; wherein the premixes have a solids content at the least about 50% by weight; and
- (b) dispensing a predetermined amount of each premix into containers or applicator(s) to form at least one caulk line.

The extender premix may further comprise at least one opacifying pigment. Alternatively or additionally, the set of caulk premixes may further comprise at least one fluid mutually compatible premix, comprising at least one opacifying pigment.

The methods herein may further comprise the step of mixing the adhesive or caulk binder premixes before, while, or after they are dispensed into the containers. The methods may further comprise the step of mixing these premixes before or while they are dispensed into the applicator(s). The methods may further include the step of adjusting the viscosity of these premixes before, while, or after they are dispensed into the containers or before or while they are dispensed into the applicator(s). The methods herein may be carried out continuously at a manufacturing facility, at a distributor, at a point-of-sale, or at a point-of-use. In addition, the methods may be controlled by a computer. By "additional premixes ["a", "b", or "c"] is meant a caulk premix different from the caulk binder premixes (a) and (b) and the caulk extender premix (c), respectively, but otherwise meeting the limitations associated with the caulk premixes (a), (b) and (c).

While exemplified with a pressure sensitive adhesive and a caulk, the present methods are not limited to preparing only pressure sensitive adhesive or caulks *per se* but may also be extended to the preparation of any water-borne or

solvent-borne adhesive, sealant, caulk or related building product. The industries and the market segments where adhesives and related products produced by the present methods can be used include adhesives used for construction, primary wood bonding, furniture, land transportation-OEM, automotive aftermarket, aerospace, electrical/electronic, appliances, packaging, bookbinding, textile, footwear, pressure-sensitive abrasives, friction materials, foundry, consumer, aerosol, medical, dental, miscellaneous product assembly, and the like.

DETAILED DESCRIPTION OF THE INVENTION

The premixes herein each contain a polymeric binder having specific properties. Polymeric binders are polymers or prepolymers which form the primary film of the adhesive. Binders bind the pigment, if present, and/or extenders and provide the required adhesive flow. The binders selected for the premix will depend upon the final use of the formulated adhesive.

Suitable polymeric binders include water-borne and solvent-borne natural and synthetic polymers, including but not limited to, homopolymers, copolymers or terpolymers such as acrylic and/or methacrylic polymers, polyvinyl acetate, polyvinyl alcohol, styrene-acrylic copolymers, styrene-butadiene copolymers, vinyl acetate-acrylic copolymers, ethylene-vinyl acetate copolymers, vinyl acetate-vinyl versatate copolymers, vinyl acetate-vinyl maleate copolymers, vinyl acetate-vinyl chloride-acrylic terpolymers, ethylene-vinyl acetate-acrylic terpolymers, polyurethane, polyvinyl butyral, structural acrylic polymers, anaerobic, cyanoacrylate polymers, polyvinyl chloride, polyvinylidene chloride, polyethylene, ethylene-vinyl acetate copolymers, polypropylene, ethylene/acrylic acid copolymer, ethylene/methyl acrylate copolymers, irradiated polyethylene, polyamide, polyester, epoxy, phenolic, amino, furan, polyimides, natural rubber, styrene copolymers and terpolymers, non-block, styrenic block copolymers, neoprene, nitrile rubber, butylene, polybutene, ethylene-propylene-diene rubbers, rubber silicone, animal glue, caseins, starch and wheat flours, dextrans, cellulose, bitumen, rosin, lignin, silicate, styrene-butadiene rubber, styrene-butadiene, acrylonitrile-butadiene-styrene, halo-diene, and the like. The polymers or prepolymers may optionally

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contain up to about 10% by weight of a functional monomer, for example, but not limited to, carboxylic acid, phosphate, sulfate, sulfonate, and amide monomers and combinations thereof, non-functional monomers, and mixtures thereof. The polymeric binders are preferably water-borne latex polymers.

With the premixes, it is optional to include minor amounts, *i.e.*, less than about 20% by weight, based on the total weight of the premixes, of conventional adhesive additives such as tackifiers, plasticizers, crosslinkers, thickeners, acids, bases, defoamers, coalescents, cosolvents, dispersing resins, mildewcides, biocides, antifreeze agents, opacifying pigments, extender pigments, colorants, glass and polymeric beads and the like. These additives must be compatible with the other adhesive ingredients in the premix and the premixes employed in formulating the adhesive lines. These optional ingredients may be added separately or added to the premixes. In the examples, the tackifier, crosslinker, and/or thickener are included as separate ingredients rather than being incorporated into the premixes.

The properties of tack, peel strength, and shear resistance, which are frequently mutually exclusive properties, may be highly important in tailoring an adhesive composition that is suitable for a particular application. Tack is generally a measure of viscous flow under conditions of fast strain rates and low stress magnitudes. Peel strength is a measure of resistance to flow at intermediate strain rates and moderate to high stress magnitudes, as well as the cohesive strength of the adhesive. Shear resistance is a measure of resistance to flow at intermediate stress magnitudes.

Polymeric additives, such as tackifiers and plasticizers, may be added to modify the properties of the adhesive including, for example, the viscoelastic behavior of the finished adhesive. The particular polymeric additive selected may vary depending, for example, on the adhesive involved and the modification sought.

Generally speaking, to enhance the performance characteristics of the adhesive the tackifier should possess a certain range of properties with respect to the adhesive to which it is added. For example, the tackifier should generally have

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a lower molecular weight than the polymer of the adhesive. In addition, the tackifier should generally have a glass transition temperature (T_g) higher than that of the adhesive's polymer. The softening temperature of the tackifier should generally be higher than that of the adhesive's polymer, and the tackifier should generally have a minimum degree of compatibility with the adhesive's polymer. Suitable tackifiers include dispersed and solid grade tackifiers such as rosin esters, rosin acids, and hydrocarbon resins including aliphatic and aromatic resins, and the like.

Plasticizers may be added to an adhesive composition, for example, to increase its workability, flexibility, and/or distensibility. They are molecules that are smaller than the polymeric binder molecules present in the adhesive system. Depending upon the involved adhesive system, the addition of a plasticizer may lower the melt viscosity, elastic modulus, and glass transition temperature (T_g) of the overall system. Plasticizers may also be added to polymer formulations to increase flexibility by promoting bond formation between the polymer molecules and the plasticizer rather than between the polymer molecules themselves. The plasticizer molecules separate the larger polymeric chains of the binder and reduce the attractive forces between them and act as a lubricant. In doing so, the plasticizer may also increase the specific volume and change the index of refraction of the resulting adhesive composition. The addition of the plasticizer may also increase the viscosity of the adhesive composition.

Suitable crosslinkers include multivalent metal such as zinc, magnesium, aluminum, calcium, iron, zirconium, and the like.

Suitable opacifying pigments include titanium dioxide (TiO_2) or a combination of titanium dioxide and auxiliary hiding pigments such as voided latex polymer particles, zinc oxide, lead oxide, synthetic polymer pigments, and mixtures thereof. Rutile and anatase grades of titanium dioxide are suitable for use herein. Rutile titanium dioxide is preferred. The surface of these titanium dioxides may be treated with various organic and/or inorganic surface treatments, e.g., as the oxides of silica, alumina, and zirconia. Fumed titanium oxide is also useful herein.

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The voided latex particles useful herein have a particle size diameter of about 100 nm to about 2,500 nm and a void fraction of about 10% to about 75%. Preferably, the voided latex particles have a particle size of about 500 nm to about 1,100 nm. The voided latex particles have at least one void but may have multiple voids, non-spherical voids, interconnected voids, voids having channels connected to the outside of the particles, and structures described as vesiculated and sponge-like. Preferably, they have a single void. The voided latex particles have a glass transition temperature (T_g) of at least about 20°C, preferably at least about 50°C. The higher the glass transition temperature, the harder the particle is and the less likely it is to collapse. If the voided latex particles collapse, they are unable to contribute to hiding. The voided latex particles may be prepared by conventional polymerization processes known in the art, such as those disclosed in US-A-3,784,391, US-A-4,798,691, US-A-4,908,271, US-A-4,972,000, US-A-5,041,464, US-A-5,157,084, US-A-5,216,044 and US-6,020,435, as well as Japanese Patent Applications 60/223,873, 61/62510, 61/66710, 61/86941, 62/127336, 62/156387, 01/185311, and 02/140272. Preferably, the voided latex particles are prepared according to US-A-4,427,836, US-A-4,469,825, US-A-4,594,363, US-A-4,880,842, US-A-5,494,971 and US-A-6,020,435.

Suitable extender pigments for use herein include barium sulfate (about 1 to about 15 microns), Blanc Fixe (about 0.5 to about 5 microns), calcium carbonate (about 0.05 to about 35 microns), silica (about 0.001 to about 14 microns), magnesium silicate (about 0.5 to about 15 microns), aluminum silicate (about 0.2 to about 5 microns), mica, bentonite, magnesium alumino-silicate, fumed alumina, colloidal attapulgite, synthetic amorphous sodium alumino-silicate, sodium potassium alumino-silicate, and the like.

Thickener is a general term which includes any material added to an adhesive to modify its rheological profile. Preferred thickeners are associative thickeners. Suitable thickeners for use herein include polyvinyl alcohol (PVA), hydrophobically-modified, alkali-soluble emulsions known in the art as HASE emulsions, alkali-soluble or alkali-swellaible emulsions known in the art as ASE

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emulsions, hydrophobically-modified ethylene oxide-urethane polymers known in the art as HEUR thickeners, and cellulosic thickeners such as hydroxymethyl cellulose (HMC), hydroxyethyl cellulose (HEC), hydrophobically-modified hydroxyethyl cellulose (HMHEC), sodium carboxymethyl cellulose (SCMC), sodium carboxymethyl 2-hydroxyethyl cellulose, 2-hydroxypropyl methyl cellulose, 2-hydroxyethyl methyl cellulose, 2-hydroxybutyl methyl cellulose, 2-hydroxyethyl ethyl cellulose, 2-hydroxypropyl cellulose, and the like. Also useful as thickeners are fumed silica, attapulgite clay and other types of clay, titanate chelating agents, and the like.

Suitable dispersants for use herein include non-ionic, anionic, and cationic dispersants such as 2-amino 2-methyl 1-propanol (AMP), dimethyl amino ethanol (DMAE), potassium tripolyphosphate (KTPP), trisodium polyphosphate (TSPP), citric acid and other carboxylic acids, and the like. Anionic polymers such as homopolymers and copolymers based on polycarboxylic acids, including those that have been hydrophobically-modified or hydrophilically-modified, e.g., polyacrylic acid or polymethacrylic acid or maleic anhydride with various monomers such as styrene, acrylate or methacrylate, diisobutylene, and other hydrophilic or hydrophobic comonomers are also suitable for use as dispersants, further including the salts of the aforementioned dispersants, and mixtures thereof.

Suitable defoamers include acetylenic diols, silicone-based and mineral oil-based defoamers, and the like.

Suitable coalescents, plasticizers, and other optional solvents include ethylene glycol, propylene glycol, hexylene glycol, 2,2,4-trimethyl-1,3-pentanediol monoisobutyrate (TEXANOL™), glycol ethers, mineral spirits, methyl carbitol, butyl carbitol, phthalates, adipates, and the like.

Suitable mildewcides and biocides include zinc oxide, isothiazolones, triazoles, and the like.

Suitable surfactants include cationic, anionic, and non-ionic surfactants.

In order to minimize the number of adhesive ingredients needed to prepare a range of adhesives, one needs to consider the extremes of the key properties

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required for the range of adhesives and formulate adhesive premixes which are capable of being blended in various combinations to provide the key properties required at the extreme values and at intermediate points as well. Specific properties may also be improved by including adhesive additives which enhance the desired property.

All ranges disclosed herein are inclusive and the minimums and maximums of the nested ranges are combinable. The measurement of tack is made in accordance with PSTC Standard Tack Test at a rate of 12 inches/minute. The measurement of peel is made in accordance with PSTC Standard Peel Test on a Polyken tester. The measurement of shear is made on a test sample with a 1 square inch overlap with a 1 kg weight under static shear at a temperature of 55-80°F. All of the above measurements are made using a coating thickness of 0.9-1.1 mils. The glass transition temperature ("T_g") is measured via differential scanning calorimetry at a rate of 20°C/minute.

EXAMPLES

Example 1 - Preparation of Adhesive Binder Premixes

Premix 1 is prepared by mixing 100 grams of an acrylic pressure sensitive polymer (N-619 available from Rohm and Haas Company, Philadelphia, PA) with 0.5 grams of a standard commercial non-ionic or anionic wetting agent, 1.0 grams of an ethoxylated phenol mechanical stabilizer, and 0.5 grams of a standard defoamer. The pH is adjusted to above 8.0 with ammonia.

Premix 2 is prepared by mixing 100 grams of an acrylic pressure sensitive polymer (N-580 available from Rohm and Haas Company, Philadelphia, PA) with 0.5 grams of a standard commercial non-ionic or anionic wetting agent, 1.0 gram of an ethoxylated phenol mechanical stabilizer, and 0.5 grams of a standard defoamer. The pH is adjusted to above 8.0 with ammonia.

Premix 3 is prepared by mixing 100 grams of an acrylic pressure sensitive polymer (N-1031 available from Rohm and Haas Company, Philadelphia, PA) with 0.5 grams of a standard commercial non-ionic or anionic wetting agent, 1.0 grams

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of an ethoxylated phenol mechanical stabilizer, and 0.5 grams of a standard defoamer. The pH is adjusted to above 8.0 with ammonia.

Example 2 - Preparation of Adhesives

Binders 1, 2, and 3 may be combined in various ratios along with various levels of dispersed tackifier and crosslinker to produce adhesives having characteristics suitable for pressure sensitive applications such as tape and label applications pressure sensitive adhesives (PSAs). The adhesives having low viscosities can be applied via gravure and Mayer rod-type applicators. The adhesives having higher viscosities are suitable for roller and die coaters.

The thickener is a HASE thickener (Acrysol TT-615 available from Rohm and Haas Company, Philadelphia, PA). The tackifier is a dispersed rosin ester, rosin acid, or a hydrocarbon. The crosslinker is multivalent metallic type.

The formulation of the adhesive premixes is shown in the following table. The ingredient levels are in grams.

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Adhesive Type												
Ingredients	Polyolefin Adhesion **	Polyolefin Adhesion	General Purpose Low Peel	General Purpose Low Peel	General Purpose High Peel***	General Purpose High Peel	Repositionable	Repositionable	Removable Low Peel	Removable Low Peel	Removable High Peel	Removable High Peel
Premix 1	50-60	50-60	-	-	70-80	70-80	20-30	20-30	-	-	10 to 20	10 to 20
Premix 2	-	-	40-50	40-50	-	-	70-80	70-80	10 to 20	10 to 20	-	-
Premix 3	5 to 20	5 to 20	40-50	40-50	-	-	-	-	80 to 90	80 to 90	80-90	80-90
Thickener	-	1 to 1.5	-	1 to 1.5	-	1 to 1.5	-	1 to 1.5	-	1 to 1.5	-	1 to 1.5
Tackifier	20-30**	20-30	5 to 10	5 to 10	20-30***	20-30	-	1 to 1.5	-	-	-	-
Crosslinker	-	-	-	-	-	-	1 to 2	1 to 2	1 to 2	1 to 2	1 to 2	1 to 2
Comments	Adhesion to polyolefin surfaces, ** range will result in moderate to high adhesion	Higher viscosity coaters	Results may range from low to moderate adhesion for label applications	Higher viscosity coaters	High adhesion/surface dependent *** range will result in moderate to high adhesion	Higher viscosity coaters	Label PSA having short term removability leading to permanent adhesion	Higher viscosity coaters	Various removability on different surfaces	Higher viscosity coaters	Higher adhesion and removability on different surfaces	Higher viscosity coaters

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Example 3 – Preparation of Caulk Premixes

The following premixes are useful for formulating a line of caulks.

A first binder premix contains a soft acrylic binder having a Tg of -50°C . (Rhoplex 1950, available from Rohm and Haas Company, Philadelphia, PA). The solids content of the binder is about 62-65%. The soft acrylic binder is formulated with caulk additives well known to those skilled in the art, such as glycols, surfactants, preservatives, mildewcides, defoamers, and optional additives, such as, silanes for adhesion.

A second binder premix contains a polymeric binder that is a lower cost, vinyl or vinyl/acrylic binder having a Tg of -9°C (Rovace 86, available from Rohm and Haas Company, Philadelphia, PA) and solids content of about 55%. It is formulated into a lower cost premix by using a plasticizer to further reduce the Tg and other caulk additives such as those used in the above acrylic binder.

An extender premix is prepared by grinding calcium carbonate and titanium dioxide in water with a dispersant and a thickener which are selected to produce a stable premix. This premix should be prepared at as high a solids content as possible to reduce the amount of water introduced into the caulk. The resulting caulk will shrink less when used to fill a space. Because of this, solid pigment and or filler can be utilized to further increase the solids of the caulk. The caulk will require mixing or milling techniques capable of handling its high viscosity.

An additive premix containing a solid-grade of hydroxy ethyl cellulose (Natrosol 250MXR, Hercules, Inc., Wilmington, DE) is prepared for use as a thickener.

Example 4 – Preparation of Caulks

A caulk is prepared by blending one or both the binder premixes with the extender premix. The additive premix is then added and the resulting mixture is milled or mixed in an a Sigma mill or Hockmeyer Mixer (Hockmeyer Equipment Corp., Elizabeth City, NC). Optionally, the mill or mixer can contain a feed screw that fills caulk tubes, thus creating a continuous process for the production of the

caulk. Utilizing the method of the invention, this continuous production of caulks could provide a line of caulks on demand.

The four premixes described above are used to produce a line of caulks by combining them in different proportions. For example, utilizing the first binder premix, the extender premix, and additive premix, a high quality caulk can be produced. Several grades of this caulk can be provided by using different amounts of the extender premix. In an analogous fashion, the second binder premix may be used to produce several lower quality/lower cost caulks. Further or alternative variations in caulk quality and properties can be achieved by using combinations of the first and second binder premixes along with the extender premix, and the additive premix (i.e., thickener). Excluding the extender premix produces a clear caulk. Using one or both of the binder premixes results in a quality range of clear caulks.

Many variations of this example are possible. The filler and pigment can be provided in the form of separate premixes and their ratio and level can be controlled so that properties such as adhesion and surface tack can be varied. Caulks with little or no titanium dioxide can be tinted or colored with other pigments. Thickeners that require neutralization with base can be utilized, including, for example, a hydrophobically-modified, alkali-swellable emulsion such as Acrysol™ TT-615 (available from Rohm and Haas Company, Philadelphia, PA). When such a thickener is used a base such as ammonium or sodium hydroxide may be added during the mixing or milling of the caulk. Mixtures of thickeners may be used. Many other caulk additives, such as fumed silica, flash rust inhibitors, zinc complex, hindered amine light stabilizers and the like may be employed in the various premixes.

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WHAT IS CLAIMED IS:

1. A set of different, but mutually compatible, fluid binder premixes sufficient to form at least one adhesive line, the set comprising:
 - (i) at least one premix which comprises at least one polymeric binder having a peel of less than about 20 ounces/inch; a tack of less than about 300 grams; and a shear of greater than about 50 hours;
 - (ii) at least one premix which comprises at least one polymeric binder having a peel of less than about 20 to about 50 ounces/inch, a tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours; and
 - (iii) at least one premix which comprises at least one polymeric binder having a peel of greater than about 50 ounces/inch, a tack of greater than about 500 grams, and a shear of less than about 10 hours.
2. An adhesive comprising the set of premixes of claim 1 and at least one additive selected from the group consisting of a tackifier, a plasticizer, a thickener, a crosslinker, and mixtures thereof.
3. The set of premixes of claim 1, wherein the number of premixes is from 3 to 15.
4. The set of premixes of claim 1, wherein at least one of the premixes further comprises at least one additive selected from the group consisting of a tackifier, a plasticizer, a thickener, and a crosslinker.
5. A method of forming at least one adhesive line, which method comprises the steps of:
 - (a) providing a set of different, but mutually compatible, fluid binder premixes which set comprises:

- (ii) at least one premix, which comprises at least one polymeric binder having a peel of less than about 20 ounces/inch, a Polyken tack of less than about 300 grams, and a shear of greater than about 50 hours;
- (iii) at least one premix which comprises at least one polymeric binder having a peel of less than 20 about 50 ounces/inch, a Polyken tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours; and
- (iv) at least one premix which comprises at least one polymeric binder having a peel of greater than about 50 ounces/inch, a Polyken tack of greater than about 500 grams, and a shear of less than about 10 hours; and

(b) dispensing a predetermined amount of each of the premixes into containers or an applicator to form the adhesive line.

6. A method of forming a range of adhesives, the range comprising at least two adhesive lines, which method comprises the steps of:

(a) providing a set of different, but mutually compatible, fluid binder premixes, which set comprises:

- (ii) at least one premix which comprises at least one polymeric binder having a peel of less than about 20 ounces/inch, a Polyken tack of less than about 300 grams, and a shear of greater than about 50 hours;
- (iii) at least one premix which comprises at least one polymeric binder having a peel of less than about 20 to about 50 ounces/inch, a Polyken tack of about 300 to about 500 grams, and a shear of about 5 to about 50 hours;
- (iv) at least one binder premix which comprises at least one polymeric binder having a peel of greater than about 50 ounces/inch,

a Polyken tack of greater than about 500 grams, and a shear of less than about 10 hours; and

(v) at least one additional different binder premix selected from premixes (i) to (iii); and

(b) dispensing a predetermined amount of each of the premixes into containers or applicators to form the adhesive lines.

7. The method of claim 5 or claim 6, further comprising the step of providing at least one additive selected from the group consisting of a tackifier, a plasticizer, a thickener, and a crosslinker.
8. The method of claim 7, further comprising the step of dispensing predetermined amount(s) of the additive(s) into the containers or the applicator.
9. The method of claim 5 or claim 6, wherein at least one of the premixes further comprises at least one additive selected from the group consisting of a tackifier, a plasticizer, a thickener, and a crosslinker.
10. The method of claim 5 or claim 6, wherein the number of premixes is from 4 to 15.
11. A set of different, but mutually compatible, fluid binder premixes sufficient to form at least one adhesive line, which set comprises at least two premixes selected from the group consisting of:
 - (a) at least one premix comprising at least one prepolymer that forms a polymeric binder having a Tg of about -70°C to about 0°C when cured;
 - (b) at least one premix comprising at least one prepolymer that forms a polymeric binder having a Tg of about -10°C to about 70°C when cured;

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- (c) at least one premix comprising at least one polymeric binder having a Tg of about 0°C to about 30°C;
- (d) at least one premix comprising at least one polymeric binder having a Tg of about -15°C to about 15°C; and
- (e) at least one premix comprising at least one polymeric binder having a Tg of about -70°C to about 0°C.

12. A method of forming at least one adhesive line, which method comprises the steps of:

- (a) providing the set of binder premixes of claim 11; and
- (b) dispensing a predetermined amount of each of the selected premixes into containers or applicator to form the adhesive line.

13. A method of forming a range of adhesives, the range comprising at least two adhesive lines, which method comprises the steps of:

- (a) providing a set of at least three different, but mutually compatible, fluid binder premixes which are selected from the group consisting of:
 - (i) at least one premix comprising at least one prepolymer that forms a polymeric binder having a Tg of about -70° to about 0°C when cured;
 - (ii) at least one premix comprising at least one prepolymer that forms a polymeric binder having a Tg of about -10°C to about 70°C when cured;
 - (iii) at least one premix comprising at least one polymeric binder having a Tg of about 0°C to about 30°C;
 - (iv) at least one premix comprising at least one polymeric binder having a Tg of about -15° to about 15°C;
 - (v) at least one premix comprising at least one polymeric binder having a Tg of about -70°C to about 0°C; and

(vi) at least one additional different premix selected from the group consisting of premixes (i), (ii), (iii), (iv), and (v); and
(b) dispensing a predetermined amount of each of the selected premixes into containers or applicators to form the adhesive lines.

14. The method of claim 5, 6, 12 or 13, further comprising the step of mixing the premixes before, while, or after the premixes are dispensed into the containers.
15. The method of claim 5, 6, 12 or 13, further comprising the step of mixing the premixes before or while the premixes are dispensed into the applicator(s).
16. The method of claim 5, 6, 12 or 13, further comprising the step of adjusting the viscosity of the premixes before, while, or after the premixes are dispensed into the containers.
17. The method of claim 5, 6, 12 or 13, further comprising the step of adjusting the viscosity of the premixes before or while the premixes are dispensed into the applicator(s).
18. The method of claim 5, 6, 12 or 13, wherein the method is carried out at a manufacturing facility.
19. The method of claim 5, 6, 12 or 13, wherein the method is carried out at a point-of-sale.
20. The method of claim 5, 6, 12 or 13, wherein the method is carried out at a point-of-use.

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21. The method of claim 5, 6, 12 or 13, wherein the method is controlled by a computer.
22. The method of claim 5, 6, 12 or 13, further comprising the step of providing at least one additive selected from the group consisting of a tackifier and a plasticizer.
23. A set of different, but mutually compatible, fluid premixes sufficient to form at least one caulk line, which set comprises:
- (i) at least one binder premix comprising at least one polymeric binder having a Tg of less than about 0°C;
 - (ii) at least one binder premix comprising at least one polymeric binder, having a Tg of less than about 25°C; and
 - (iii) optionally at least one extender premix comprising at least one extender.
24. The set of premixes of claim 23, which set further comprises at least one additional fluid binder premix or fluid extender premix.
25. The set of premixes of claim 24, wherein the fluid extender premix further comprises at least one opacifying pigment.
26. The set of premixes of claim 23, further comprising at least one fluid opacifying premix comprising at least one opacifying pigment.
27. A method of forming at least one caulk line, which method comprises the steps of:
- (a) providing the set of the premixes of claim 23, 24, 25 or 26; and
 - (b) dispensing a predetermined amount of each of the selected premixes into containers or applicator(s) to form the caulk line.

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28. The method of claim 27, wherein the method is continuous.
29. The method of claim 27, further comprising the step of mixing the premixes before, while, or after they are dispensed into the containers.
30. The method of claim 27, further comprising the step of mixing the premixes before or while they are dispensed into the applicator(s).
31. The method of claim 27, further comprising the step of adjusting the viscosity of the premixes before, while, or after they are dispensed into the containers.
32. The method of claim 27, further comprising the step of adjusting the viscosity of the premixes before or while they are dispensed into the applicator(s).
33. The method of claim 27, wherein the method is carried out at a manufacturing facility.
34. The method of claim 27, wherein the method is carried out at a point-of-sale.
35. The method of claim 27, wherein the method is carried out at a point-of-use.
36. The method of claim 27, wherein the method is controlled by a computer.

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ABSTRACT OF THE INVENTION

Sets of fluid premixes useful for adhesives and caulks are provided. Also provided are methods of providing adhesive lines and a caulk lines using the sets of premixes. Further provided are ranges of adhesives and caulks based on the adhesive and caulk lines. Utilizing these methods the manufacturer, seller, or user can to adjust the adhesive or caulk at the point of manufacture, sale, or use to suit the processing and end-use conditions, in addition to the other benefits offered by delayed product differentiation.

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Docket No. 6258-71

DECLARATION AND POWER OF ATTORNEY

As below named inventors, We hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and joint inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PREMIXES AND METHOD OF PREPARING ADHESIVES AND CAULKS FROM PREMIXES

the specification of which (check one) is:

☒ attached hereto

☐ was filed on

as Application Serial No. .

and amended on _____ (if applicable).

☐ was described and claimed in PCT Application No.

filed on, and amended under Article 19 on _____

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose all information I know to be material to patentability in accordance with Title 37, Code of Federal Regulation, § 1.56.

I hereby claim foreign priority benefits under Title 35, United States Code § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

<u>Serial Number</u>	<u>Country</u>	<u>Filing Date</u>	<u>Priority Claimed</u> <u>(Y/N)</u>
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I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

<u>Serial Number</u>	<u>Filing Date</u>	<u>Status</u>
60/183,655	2/18/00	pending
60/183,656	2/18/00	pending
60/247,639	11/10/00	pending

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

And I hereby appoint:

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all of the firm of Clifford Chance Rogers & Wells LLP, 200 Park Avenue, New York, New York 10166-0153, my attorney with full power of substitution and revocation; to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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Wherefore I request that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, declaration, power of attorney, and this petition.

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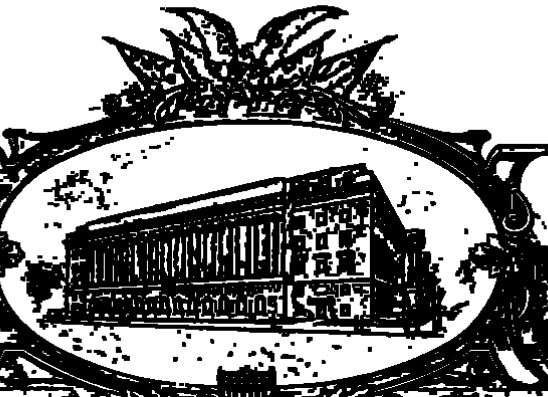
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UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

April 12, 2001

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE UNDER 35 USC 111.

APPLICATION NUMBER: 60/247,639

FILING DATE: *November 10, 2000*



By Authority of the
COMMISSIONER OF PATENTS AND TRADEMARKS

M. K. Hawkins

M. K. HAWKINS
Certifying Officer

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This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)					
Given Name (first and middle (if any))	Family Name or Surname	Residence (City and either State or Foreign Country)			
John M.	Friel	Warminster, PA			
John W.	Hook, III	Warminster, PA			
☒ Additional inventors are being named on the <u>1</u> separately numbered sheets attached hereto					
TITLE OF THE INVENTION (200 characters max) PREPRINTS AND METHODS OF PREPARING PAINTS FROM THE PREPRINTS					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
☐ Customer Number				Place Customer Number Bar Code Label here	
OR Type Customer Number here					
☒ Firm or Individual Name		Margaret B. Kelley, Clifford Chance Rogers & Wells, LLP			
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ENCLOSED APPLICATION PARTS (check all that apply)					
☒ Specification Number of Pages		47		☐ CD(s), Number	
☐ Drawing(s) Number of Sheets				☐ Other (specify)	
☐ Application Data Sheet. See 37 CFR 1.78					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT					
☐ Applicant claims small entity status. See 37 CFR 1.27.				FILING FEE AMOUNT (\$)	
☐ A check or money order is enclosed to cover the filing fee.				S150.00	
☒ The Commissioner is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number:		50-0521			
☐ Payment by credit card. Form PTO-2036 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
☒ No					
☐ Yes, the name of the U.S. Government agency and the Government contract number are _____					

Respectfully submitted,

SIGNATURE

Margaret B. Kelley

TYPED or PRINTED NAME

Margaret B. Kelley

TELEPHONE

212-878-3145

Date

11/01/00

REGISTRATION NO.

(if appropriate)

Docket Number:

29,181

006251/00013

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 38 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 5 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

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PROVISIONAL APPLICATION COVER SHEET *
Additional Page

PTO 3B/16 (2-00)

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CLASS 0001-0002

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Bernhard H.	Lieser	San Pedro, CA	

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PREPAINTS AND METHODS OF PREPARING PAINTS FROM THE PREPAINTS

Background of The Invention

This invention relates to sets of prepaint compositions, a method of preparing paint lines from sets of prepaint compositions, and to a method of preparing a range of paints from sets of prepaint compositions.

Paints or coatings encompass, for example, latex paints, enamels, lacquers, varnishes, undercoats, surfacers, primers, sealers, fillers, and stoppers. Most paints contain a pigment, a polymer or binder which acts as a film-former to bind the pigment particles together, and a fluid medium in which the polymer is dissolved or dispersed. If the pigment is omitted, the paint is referred to as a clear, varnish, lacquer, or topcoat. Lacquers usually refer to thermoplastic coating compositions, whereas enamels refer to thermosetting paints.

Paint formulating involves the process of selecting and admixing appropriate paint ingredients in the correct proportions to provide a paint with specific processing and handling properties, as well as the desired final dry paint film properties. The major ingredients of many paint formulations are a binder, an opacifying pigment, optional pigment extenders, and a fluid medium, namely, water if the paint is a waterborne paint such as a latex paint, or solvent if the paint is a solvent-borne paint such as an oil-based paint. Common optional ingredients include defoamers, coalescents, plasticizers, thickeners, non-thickening rheology modifiers, solvents, driers, anti-skinning agents, surfactants, mildewcides, biocides and dispersants. After the paint is formulated and applied to a surface, the paint dries by evaporation of the solvent and/or the water, with or without the application of heat, and the binder forms a film containing therein the pigment and the extender particles, if any.

A paint line, as used herein, includes at least two different paints which offer dried film properties which differ materially from each other in at least one observable property such as sheen, outdoor durability, and color depth. A paint line may include, for example, three paints the dried films of which have different sheen levels, two paints the dried films of which have suitable interior or exterior performance, or four paints the dried films of which offer different

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manufacturers to store many different paint ingredients and change paint ingredients during manufacture depending on the specific paint type being prepared.

Furthermore, it requires paint retailers to carry a large inventory of paints in order to offer a range of paints, such as various sheen levels, tint bases, paints for exterior use, paints for interior use, and paints of various quality. It would be desirable to make paints, either at a relatively large-scale industrial plant or at a relatively smaller-scale, point-of-sale or point-of-use location using a limited number of paint ingredients to prepare all of these different paint formulations, thus, minimizing the number and type of paint ingredients to make a range of paints.

Summary of the Invention

In order to minimize the number of paint ingredients needed to prepare a range of paints, one needs to consider the extremes of key properties required by the range of paints and formulate prepaint compositions which are capable of being blended in various combinations and proportions to provide the key properties required at their extreme values and at intermediate points as well.. Specific properties may also be improved by adding paint additives which enhance the desired property.

We have discovered that we are able to achieve this goal by employing a set of prepaints sufficient to formulate at least one paint line, including:

1. at least one fluid prepaint x, including at least one opacifying pigment;
2. at least one fluid prepaint y, including at least one extender pigment ; and
3. at least one fluid prepaint z, including at least one polymeric binder;

wherein the number of prepaints is preferably 3-15; wherein the prepaints are different from each other, and wherein the prepaints are mutually compatible.

We have also discovered a method of forming at least one paint line including:

- i. providing a set of prepaints sufficient to formulate at least one paint line, including:
 - a. at least one fluid prepaint x, including at least one opacifying pigment;
 - b. at least one fluid prepaint y, including at least one extender pigment; and
 - c. at least one fluid prepaint z, including at least one polymeric binder;

wherein the total number of prepaints is preferably 3-15; wherein each of the prepaints is different from each other, and wherein the prepaints are mutually compatible; and

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2. dispensing predetermined amounts of prepaint(s) x, prepaint(s) y, and prepaint(s) z into containers or application devices to form at least one paint line.

The method may further include the step of mixing prepaint(s) x, prepaint(s) y, and prepaint(s) z before, while, or after they are dispensed into the container or before or while they are dispensed into the application device.

We have also discovered a method of forming a range of paints, the range including at least two paint lines, including:

1. providing a set of prepaints sufficient to formulate the range of paints, including:
 - a. at least one fluid prepaint x, including at least one opacifying pigment;
 - b. at least one fluid prepaint y, including at least one extender pigment;
 - c. at least one fluid prepaint z, including at least one polymeric binder; and
 - d. at least one additional fluid prepaint x', y', or z',wherein the total number of prepaints is preferably 4-15;
wherein each of the prepaints is different from each other; and
wherein the prepaints are mutually compatible; and
2. dispensing predetermined amounts of prepaint(s) x, prepaint(s) y, and prepaint(s) z and the at least one additional prepaint into containers or application devices to form a range of paints.

The methods may further include the step of mixing prepaint(s) x, prepaint(s) y, prepaint(s) z, and the at least one additional prepaint before, while, or after they are dispensed into the container or before or while they are dispensed into the application device.

The methods may further include the step of adjusting the viscosity of dispensed prepaints before, while, or after they are dispensed into the container or before or while they are dispensed into the application device using a thickener, water, or a mixture thereof.

The methods may further include the step of adding additional materials may be added to the prepaints and/or paints that enhance the application or final performance properties of the paint.

The methods may further include the step of adding at least one colorant to the dispensed prepaints.

The methods may be carried out at a paint manufacturing facility, at the point-of-sale, or at the point-of-use and may be controlled by a computer.

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If one paint line is desired, i.e., if one key property is varied (for example, sheen level, tint base, use type, or quality type), then the complete paint line can be made from one each of prepaint x, prepaint y and prepaint z.

If a range of paints including two paint lines is desired, i.e., if two key properties are varied (for example, two selected from sheen level, tint base, use type, and quality type), then the range of paints may be made from at least one each of prepaint x, prepaint y, and prepaint z and least one additional prepaint x', y', or z', depending on which key properties are to be varied. By "additional prepaint x', y', or z'" is meant herein a prepaint different from prepaint x, y, or z, respectively, but otherwise meeting the limitations associated with prepaint x, y, or z.

If a range of paints including three paint lines is desired, i.e., if three key properties are varied (for example, three selected from sheen level, tint base, use type, and quality type), then the range of paints can be made from at least one each of prepaint x, prepaint y and prepaint z and at least two additional prepaints x', y', or z', depending on which key properties are to be varied.

If a range of paints including four paint lines is desired, i.e., if four key properties are varied (for example, sheen level, tint base, use type, and quality type), then the complete range of paints can be made from at least one each of prepaint x, prepaint y and prepaint z and at least three additional prepaints x', y', or z', depending on which key properties are to be varied.

This technique may be continued to vary as many additional key properties as desired.

A paint line includes two or more different paints the dried films of which differ materially from each other in at least one observable property. The paints are different from each other and must meet at least one of the following criteria: 1) the pigment volume concentration (PVC) of the paints of the lines which are most different from each other in PVC must differ from each other by at least 2% or 2) the volume solids content ("VS") of the paints of the line which are most different from each other in VS must differ from each other by at least 2%.

The pigment volume concentration ("PVC") is a measure of how "binder-rich" a paint formulation. It is calculated herein by the following formula:

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$$\text{PVC (\%)} = \frac{(\text{volume of pigment(s)} + \text{volume extender(s)})}{(\text{volume of pigment(s)} + \text{volume extender(s)} + \text{volume binder}) \times 100}$$

The volume solids content ("VS" herein) is the dry volume (dry vol.) of pigment(s) plus the dry volume (dry vol.) of extender (s) plus the dry volume (dry vol.) of binder(s). It is calculated herein by the following formula:

$$\text{VS (\%)} = \frac{\text{dry vol. of pigment(s)} + \text{dry vol. of extender(s)} + \text{dry vol. of binder(s)}}{\text{total volume of paint}} \times 100.$$

If additives are present, their volume is not included in determining the total dry volume.

In each of the above embodiments, the prepaint compositions are selected so that they cover a wide formulation space so that the desired final paint properties lie within the blend space defined with the prepaints at the extremes. In many cases the prepaints will not by themselves be practical paints. But by pushing the prepaints to these extremes one can maximize the blend space available for the system. When the prepaints, additives, and colorants are all fully compatible, they can be blended at desired ratios, without inducing colloidal instability, to achieve the desired paint line(s) and range of paints.

This technique is similar to the design principles used in statistical experimental design and analysis of mixture component designs; however, instead of designing a mixture space to explore the response surface within it, one is designing the boundaries of the mixture space to maximize the flexibility of the paint system. The key to success is to have mutual compatibility of the individual ingredients and prepaints across the mixture space.

Paint properties can be predicted in a number of ways. One approach is to develop response surface models of the blend space using standard Mixture Component experimental design statistical tools. These simple statistical models can then be used by a linear optimization program, by a massive grid search, or by a graphical analysis tool. Another approach is to simply use empirical methods to determine which blends are needed for specific paint lines, then incorporate those simple empirical recipes in the of the software paint making machine.

An extension of the techniques is to have the paint machine automatically pretest certain key properties (e.g., viscosity, forced dry gloss, or color) and make minor adjustments during the formulating of the paint from the prepaints. Having feedback loops in the paint machine can provide more precise matching of color, gloss, and viscosity targets.

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As used herein, prepaints are mutually compatible if the paints formed by admixing the prepaints do not evidence signs of colloidal instability such as flocculation. Preferably, the paints formed from the prepaints exhibit less than 5 g of residue such as gel and grit per liter of paint when the paint is passed through a 325 mesh screen. More preferably, the paints formed from the prepaints exhibit less than 1g of residue per liter of paint when the paint is passed through a 325 mesh screen. Preferably, the prepaints exhibit less than 5 g. of residue per liter of prepaint when the prepaint is passed through a 325 mesh screen. More preferably, the prepaints exhibit less than 1 g of residue per liter of prepaint when the prepaint is passed through a 325 mesh screen. If the prepaints, optional additives included to enhance specific paint properties, and colorants are fully compatible, i.e., they can be blended at any ratio without inducing colloidal instability, then they can be blended in any combination falling within the formulation space needed to achieve the desired property profile in the final paint. It is sufficient, however, for the prepaints, optional additives included to enhance specific paint properties, and colorants to be compatible, i.e., they can be blended at desired ratios without inducing colloidal instability to achieve the desired property profile in the range of paints.

As used herein, compatible paint ingredients include ingredients which can be combined in the various prepaints, and the paints formed from the prepaints to provide the properties characteristic for the amount of and type ingredient(s) used.

It is preferred that the all fluid prepaints employed in the methods of the invention have the same or similar viscosities to aid in mixing.

The water-resistance properties, including blister resistance, wet adhesion, and scrub resistance, of the paints prepared by the method of the invention, are expected to be improved because of the use of lower amounts of stabilizing materials such as surfactants which may be used relative to conventional formulating techniques. Further, a line of pains or a range of paints prepared by the methods of this invention may react more predictably to added colorants, making color matching easier and facilitating the use of software for color matching. In addition, viscosity fluctuation in the final paint formulation is expected to be reduced because of the prior equilibration of ingredients in the prepaints.

The prepaints are formulated to maximize the flexibility of paint manufacturing. Rather than purchasing individual paint ingredients, paint manufacturers, and even buyers at point-of-sale and point-of-use (paint stores, paint departments, and contractors), can purchase a set of

prepaints to prepare a desired range of paints. These sets of prepaints will contain at least one each of prepaints x, y and z and possibly additional prepaints depending upon the formulating flexibility desired. Optionally, the above prepaints are mixed with an additional prepaint which includes at least one colorant, such as a colored pigment or dye.

The method of the present invention is not limited to preparing only latex paints *per se*, but may also be extended to preparing any water-borne or solvent-borne coating, or related building product requiring mixing of ingredients, including, sealants, caulks, mastics, adhesives and other building-related products.

Description of Preferred Embodiments

One embodiment of prepaint x is a fluid titanium dioxide prepaint including at least one opacifying pigment, at least one dispersant, at least one thickener, and water; wherein the dispersant(s) and the thickener(s) are compatible with the pigment(s) and with other optional paint ingredients, and wherein the prepaint has a volume solids content of about 30% to about 70%, preferably about 35% to about 50% and a Stormer viscosity of about 50 to about 250 Krebs Units (KU) preferably about 60 to about 150 KU.

In an alternate embodiment of prepaint x, it is a fluid titanium dioxide prepaint useful for formulating a one pack, pigmented latex paint containing other paint ingredients, which prepaint includes at least one opacifying pigment, at least one dispersant, at least one thickener, at least one film-forming or nonfilm-forming polymeric binder, and water; wherein the dispersant(s), the thickener(s), and the polymer(s) are compatible with the pigment(s) and with the other optional paint ingredients, and wherein the prepaint has a volume solids content of about 30% to about 70%, preferably about 35% to about 50%, a PVC of about 35% to 100%, preferably about 50% to 100%, and a Stormer viscosity of about 50 to about 250 KU, preferably about 60 to about 150 KU. Preferably, the prepaint is stable to sedimentation, by which is meant herein that the pigment does not settle out after 10 days at about 25 °C. Optionally, the polymeric binder is adsorbed onto the opacifying pigment.

In one embodiment of prepaint y, it is a fluid pigment extender prepaint which includes at least one mineral extender, at least one thickener, an optional polymeric binder, and water; wherein the pigment extender prepaint has a volume solids content of about 30% to about 70%, preferably about 35% to about 65%, a PVC of about 35% to 100%, preferably about 40% to

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100%, and a Stormer viscosity of about 50 to about 250 KU, preferably about 60 to about 150 KU; and wherein the prepaint ingredients are compatible with each other and with the ingredients of the other prepaints desired to be used therewith.

In one embodiment of prepaint z, it is a fluid polymeric binder prepaint which includes a water-borne polymeric binder having a glass transition temperature (T_g) of about -30°C to about 70°C, preferably about -10°C to about 60°C, and water; wherein the binder prepaint has a volume solids content of about 25% to about 70%, preferably about 30% to about 65%, and a Brookfield viscosity of less than about 100,000 centipoise (CPS), preferably about 100 to about 50,000 centipoise, at a shear rate of 1.25 reciprocal seconds; and wherein the prepaint ingredients are compatible with each other and with the ingredients of the other prepaints desired to be used therewith.

In the embodiments of prepaints x, y and z, it is optional to include minor amounts, *i.e.*, less than about 10% by weight, based on the total weight of the prepaint, of conventional paint additives including acid, base, defoamer, coalescent, cosolvent, mildewcide, biocide, antifreeze agent and the like. These additives must be compatible with the other paint ingredients in the prepaint and the prepaints employed in the methods of this invention.

Opacifying pigments useful in the methods and prepaints of the invention include white pigments which impart white scattering power to the paint across all visible wave lengths without a high degree of absorption. Pigment extenders are inorganic solids or opaque polymers which do not impart the primary color or hiding power to the paint although they may have secondary influences on those properties. The tint bases used for deep tone paints typically contain no or only very low levels of opacifying pigments.

Suitable opacifying pigments include titanium dioxide (TiO₂) or a combination of titanium dioxide and auxiliary hiding pigments such as voided latex polymer particles, zinc oxide, lead oxide, a synthetic polymer pigment and mixtures thereof. Rutile and anatase grades of titanium dioxide are suitable for use herein. Rutile titanium dioxide is preferred. The surface of these titanium dioxides may be treated with various organic surface treatments and/or inorganic surface treatments, *e.g.*, as the oxides of silica, alumina, and zirconia. Fumed titanium oxide is also useful herein.

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The voided latex particles useful in the method of the invention have a particle size diameter of about 100 nm to about 2,500 nm and a void fraction and preprints of about 10% to about 75%. Preferably, the voided latex particles useful in the method of the invention have a particle size of about 500 nm to about 1,100 nm. The voided latex particles have at least one void but may have multiple voids, non-spherical voids, interconnected voids, voids having channels connected to the outside of the particles, and further encompass structures described as vesiculated and spongelike. Preferably, the voided latex particles have a single void. The voided latex particles have a glass transition temperature (T_g), as measured by differential scanning calorimetry at a rate of about 20°C/min, of at least about 20°C, preferably at least 50°C. The higher the (T_g), the harder the particle is and the less likely it is to collapse. If the voided latex particles collapse, they are unable to contribute to hiding. They may be prepared by conventional polymerization processes known in the art, such as those disclosed in U.S. Patent Nos. 3,784,391, 4,798,691, 4,908,271, 4,972,000, 5,041,464, 5,157,084, and 5,216,044, the disclosures of which are incorporated herein by reference, as well as Japanese Patent Applications 60/223,873, 61/62510, 61/66710, 61/86941, 62/127336, 62/156387, 01/185311, and 02/140272. Preferably, the voided latex particles are prepared according to U.S. Patent Nos. 4,427,836, 4,469,825, 4,594,363, 4,880,842 and 5,494,971, the disclosure of which are incorporated herein by reference.

Extender pigments useful herein include exterior and interior extender pigments optimized for the intended end use. Exterior extender pigments are not soluble in water and have a low absorption number. They are optimized for exterior durability in the particular market where the paint will be sold, and do not detract from the desired non-cracking, non-chalking, and non-dirt-retaining properties of the dried paint. They also provide low cost volume. Interior extender pigments are optimized for hiding, gloss, and low cost. Suitable extender pigments include barium sulfate (about 1 - about 15 microns), Blanc Fixe (about 0.5 - about 5 microns), calcium carbonate (about 0.05 - about 35 microns), silica (about 0.001 - about 14 microns), magnesium silicate (about 0.5 - about 15 microns), aluminum silicate (about 0.2 - about 5 microns), mica, bentonite, magnesium alumino-silicate, fumed alumina, colloidal attapulgite, synthetic amorphous sodium alumino-silicate, and sodium potassium alumino-silicate, and the like.

Polymeric binders are polymers or prepolymers which form the primary film of the paint. Binders bind the pigment and/or extenders, provide the required paint flow, and determine the

gloss and hardness of the final paint film. The binders selected for the prepaints will depend upon the final use of the formulated paints. Binders suitable for exterior paints are generally suitable for interior paints, but binders suitable for interior paints may not be suitable for exterior paints.

Suitable polymeric binders include, but are not limited to, homopolymers, copolymers or terpolymers having compositions such as, for example, acrylic and/or methacrylic, polyvinyl acetate, styrene-acrylic, styrene-butadiene, vinyl acetate-acrylic, ethylene-vinyl acetate, vinyl acetate-vinyl versatate, vinyl acetate-vinyl maleate, vinyl acetate-vinyl chloride-acrylic, ethylene-vinyl acetate-acrylic, and urethane polymers, optionally containing up to about 10% by weight of functional and other monomers, and mixtures thereof. Polymeric binders optionally incorporated in prepaints x, y, x', y', or other prepaints may be the same as or different from the polymeric binder of prepaint z.

Thickener is a general term which includes any material added to a paint to modify its rheological profile. Preferred thickeners are associative thickeners. Suitable thickeners for use herein include polyvinyl alcohol (PVA); hydrophobically-modified, alkali soluble emulsions, known in the art as HASE emulsions; alkali soluble or alkali swellable emulsions, known in the art as ASE emulsions; hydrophobically modified ethylene oxide-urethane polymers known in the art as HEUR thickeners; and cellulosic thickeners such as hydroxymethyl cellulose (HMC), hydroxyethyl cellulose (HEC), hydrophobically-modified hydroxy ethyl cellulose (HMHEC), sodium carboxymethyl cellulose (SCMC), sodium carboxymethyl 2-hydroxyethyl cellulose, 2-hydroxypropyl methyl cellulose, 2-hydroxyethyl methyl cellulose, 2-hydroxybutyl methyl cellulose, 2-hydroxyethyl ethyl cellulose, 2-hydroxypropyl cellulose, and the like. Also useful as thickeners are fumed silica, attapulgite clay and other types of clay, titanate chelating agents, and the like.

Suitable dispersants for use herein include non-ionic, anionic and cationic dispersants such as 2-amino 2-methyl 1-propanol (AMP), dimethyl amino ethanol (DMAE), potassium tripolyphosphate (KTPP), trisodium polyphosphate (TSPP), citric acid and other carboxylic acids, and the like. Anionic polymers such as homopolymers and copolymers based on polycarboxylic acids, including those that have been hydrophobically- or hydrophilically-modified, e.g., polyacrylic acid or polymethacrylic acid or maleic anhydride with various monomers such as styrene, acrylate or methacrylate esters, diisobutylene, and other hydrophilic

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or hydrophobic comonomers are also suitable for use as dispersants, further including salts of the aforementioned dispersants, and mixtures thereof.

Suitable defoamers include silicone-based and mineral oil-based defoamers, and the like.

Coalescents are not necessary if solvent-free polymeric binders are used in the binder prepaints. Solvent-free binders typically have a low T_g and low minimum film-forming temperature so that they are film-forming at ambient temperatures, such as about 20 °C. If a coalescent is required, preferably it is incorporated in each of prepaint z and any other prepaints containing polymeric binders..

Suitable coalescents, plasticizers, and other optional solvents include ethylene glycol, propylene glycol, hexylene glycol, 2,2,4-trimethyl-1,3-pentanediol monoisobutyrate (TEXANOL™), glycol ethers, mineral spirits, methyl carbitol, butyl carbitol, phthalates, adipates, and the like.

Suitable mildewcides and biocides include zinc oxide, isothiazolones, triazoles, and the like.

Suitable surfactants include cationic, anionic, and non-ionic surfactants.

EXAMPLES

Test Procedures

The Stormer viscosity of the prepaints is measured using ASTM method D562.

The Brookfield viscosity of the binder prepaints and final paints is measured using spindle #4 of a Brookfield viscometer at 6 rpm at room temperature (about 70°F).

The ICI viscosity of the prepaints and paints is measured using ASTM method D3205-77.

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Example 1

This example describes the preparation of a white prepaint which was prepared by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Titanium Dioxide Slurry (76.5% solids) (Ti-Pure™ R-746 – DuPont)	1152.25
Dispersant (Tamol™ 1124 – Rohm and Haas)	7.06
Defoamer (Drewplus™ L-475)	1.00
Binder Acrylic (50% solids – Tg 28 °C (Rhoplex™ SG – 10M – Rohm and Haas)	166.32
Opacifer – Voided Latex Particles (Ropaque™ OP-96 – Rohm and Haas)	151.80
Coalescent (Texanol™)	12.95
Rheology Modifier (Acrysol™ RM-8W – Rohm and Haas)	12.76
Base – Ammonia (28%)	1.65

The prepaint was prepared using a laboratory mixer having a 45° pitch stirring blade. The water, dispersant, and defoamer, were combined and mixed. The titanium dioxide slurry was slowly added and the mixture was stirred for 15-20 minutes. The binder, coalescent, rheology modifier, ammonia, and additional water if necessary were then added.

The resulting prepaint had a total volume of 100 gallons, total weight of 1,505.8 lbs., total PVC of 80.0%, volume solids of 44.0%, weight solids of 67.1%, density of 15.058 lbs./gallon, 0.40% dispersant on pigment solids, and 10.0% coalescent on latex solids. Its initial and equilibrated Stormer viscosities were 88 and 90 KU. Its initial and equilibrated pH values were 8.8 and 8.6.

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Example 2

This example describes the preparation of an exterior pigment extender prepaint. It was prepared as above by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Nephilene Sycnite (7.5 μ) (Minex™ 4)	784.30
Dispersant (Tamol™ 1124 - Rohm and Haas)	7.84
Defoamer (Drewplus™ L-475)	2.00
Binder Acrylic (53.5% solids – Tg 18 °C) (Rhoplex™ ML-200 - Rohm and Haas)	157.49
Coalescent (Texanol™)	5.90
Rheology Modifier (Acrysol™ RM-8W - Rohm and Haas)	2.55
Water	368.86

The resulting prepaint had a total volume of 100 gallons, total weight of 1,328.9 lbs., total PVC of 80.0%, volume solids of 45.0%, weight solids of 65.4%, density of 13.29 lbs./gallon, 0.50% total dispersant on pigment solids and 7.0% total coalescent on binder solids. The initial and equilibrated Stormer viscosities were 90 and 93. The initial and equilibrated pH values were 8.9 and 8.7.

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Example 3

This example describes the preparation of an interior pigment extender prepaint which was prepared as described above by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Calcium Carbonate (12μ) (Omycarb™ 12)	405.67
Pigment – Calcium Carbonate (3.2μ) (Vicron™ 15-15)	203.59
Pigment – Aluminum Silicate (1.4μ) (Optiwhite™)	165.41
Dispersant (Tamol™ 1124 -Rohm and Haas)	7.75
Defoamer (Drewplus™ L-475)	1.00
Binder – Vinyl Acetate/Acrylic (55% solids – Tg 14 °C) (RES™ 3803- Rohm and Haas)	157.61
Coalescent (Texanol™)	6.07
Rheology Modifier – HEUR (Acrysol™ RM-2020-NPR)	17.53
Base – Ammonia (28%)	0.87
Water	356.59

The resulting prepaint had a total volume of 100 gallons, total weight of 1,322.1 lbs., total PVC of 80%, volume solids of 45%, weight solids of 65.15%, density of 13.2210 lbs./gallon, 0.50% dispersant on pigment solids, and 7.00% coalescent on binder solids, its initial and equilibrated Stormer viscosities were 94 and 97. Its initial and equilibrated pH values were both 9.2.

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Example 4

This example describes a vinyl acetate/acrylic polymeric binder prepaint which was prepared as described above except that the binder, defoamer, coalescent, ammonia, water, and rheology modifier were combined and mixed. The ingredients and amounts were as follows:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Drewplus™ L-475)	8.00
Binder – Vinyl Acetate/Acrylic (55% solids – Tg 14 °C) (RES™ 3803- Rohm and Haas)	788.06
Coalescent (Texanol™)	30.34
Rheology Modifier –HEUR (Acrysol™ SCT-275 - Rohm and Haas)	3.02
Base – Ammonia (28%)	1.95
Water	60.08

The resulting prepaint had a total volume of 100 gallons, total weight of 891.5 lbs., volume solids of 45.0%, a weight solids of 48.6%, a density of 8.91 lbs./gallon and 7.0% coalescent on binder solids. Its initial and equilibrated Stormer viscosities were 88 and 90. Its initial and equilibrated pH values were 8.6 and 8.4. Its equilibrated Brookfield viscosity should be less than 10,000 cps.

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Example 5

This example describes a flat acrylic binder prepaint which was prepared as above by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Drewplus™ L-475)	8.00
Binder – Acrylic (53.5% solids – Tg 18°C) (Rhoplex™ ML-200 - Rohm and Haas)	769.96
Coalescent (Texanol™)	28.83
Rheology Modifier (HEUR) (Acrysol™ RM-8W - Rohm and Haas)	1.15
Base – Ammonia (28%)	.57
Solvent – Propylene Glycol	60.00
Water	12.84

The resulting prepaint had a total volume of 100 gallons, total weight of 881.4 lbs., volume solids of 44.0%, weight solids of 46.7%, density of 8.81 lbs./gallon, and 7.0% coalescent on binder solids. Its initial and equilibrated Stormer viscosities were 91 and 89. Its initial and final pH values were both 8.9/9.0. Its equilibrated Brookfield viscosity should be less than 10,000 cps.

Example 6

This example describes a gloss acrylic binder prepaint which was prepared as described above by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Drewplus™ L-475)	8.00
Binder – Acrylic (50% solids – Tg 28°C) (Rhoplex™ SG-10M - Rohm and Haas)	737.08
Coalescent (Texanol™)	36.85
Rheology Modifier – HEUR (Acrysol™ RM 8W - Rohm and Haas)	11.62
Base – Ammonia (28%)	.35
Solvent – Propylene Glycol	60.00
Water	21.26

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The resulting prepaint had a total volume of 100 gallons, a total weight of 875.2 lbs., volume solids of 39.0%, a weight solids of 42.11%, a density of 8.75 lbs./gallon and 10.0% coalescent on binder solids. . Its initial and equilibrated Stormer viscosities were 97 and 98. The initial and equilibrated pH values were 9.0. Its equilibrated Brookfield viscosity should be less than 10,000 cps.

Example 7

This example describes the preparation of a white pigment prepaint including a solvent-free acrylic binder and without the use of a coalescent. The ingredients are mixed as described in Example 1 using the ingredients and amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment -Titanium Dioxide (Ti-Pure™ R-706 - DuPont)	734.49
Opacifier - Voided Latex Particles (Ropaque™ OP-96 - Rohm and Haas)	164.43
Dispersant (Tamol™ 731 - Rohm and Haas)	29.38
Non-ionic Surfactant (Triton™ CF-10)	2.00
Biocide (Kathon™ LX (1.5%) - Rohm and Haas)	2.00
Defoamer (Foamaster™ VL)	3.00
Binder - Acrylic copolymer (43.5% solids - Tg -2 °C) (Rhoplex™ SF-012 - Rohm and Haas)	165.96
Rheology Modifier - HEUR (Acrysol™ RM-825 - Rohm and Haas)	5.00
Rheology Modifier - HEUR (Acrysol™ RM-2020 NPR - Rohm and Haas)	42.69
Base - Ammonia (28%)	.49
Water	250.13

The resulting prepaint should have a total volume of 100 gallons, total weight of 1,401.3 lbs., total PVC of 80.0%, volume solids of 40.0%, weight solids of 61.1% density of 14.01 lbs./gallon, and 1.0% dispersant on pigment solids. Its estimated Stormer viscosity is 102 KU. Its pH should be 8.5 - 9.0.

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Example 8

This example describes the preparation of an exterior pigment extender prepaint with a solvent-free acrylic binder without the use of a coalescent. The ingredients are mixed as described in Example 1 using the ingredient amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Nepheline Syenite (7.5μ) (Minex™ 4)	697.16
Dispersant (Tamol™ 731 - Rohm and Haas)	27.89
Non-ionic Surfactant (Triton™ CF-10)	2.00
Biocide (Kathon™ LX (1.5%) - Rohm and Haas)	2.00
Defoamer (Foamaster™ VL)	3.00
Binder – Acrylic (46.5% solids – Tg 1 °C) (Primal™ SF-015 Rohm and Haas)	160.84
Rheology Modifier HEUR (Acrysol™ RM-2020 NPR - Rohm and Haas)	101.80
Water	284.47

The resulting prepaint should have a total volume of 100 gallons, total weight of 1,280.9 lbs., total PVC of 80.0%, volume solids of 40.0%, weight solids of 60.27%, density of 12.81 lbs./gallon, and 1.0% dispersant on pigment solids. Its Stormer viscosity should be 95 KU. Its pH should be 8.5 – 9.0. If not, the pH is adjusted as described in Example 7.

Example 9

This example describes the preparation of an interior pigment extender prepaint including a solvent-free vinyl acetate/acrylic binder without the use of a coalescent. The ingredients are mixed as described in Example 1 using the ingredient amounts set out below.

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<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment - Calcium Carbonate (3.2μ) (Snowflake™)	451.20
Pigment - Aluminum Silicate (1.4μ) (Optiwhite™)	220.37
Dispersant (Tamol™ 1254 - Rohm and Haas)	19.19
Non-ionic Surfactant (Triton™ CF-10)	2.00
Biocide (Kathon™ LX (1.5%))	2.00
Defoamer (Foamaster™ VL)	3.00
Binder - Vinyl Acetate/Acrylic (55% solids) (Rovace™ 9900)	139.86
Rheology Modifier HASE (Acrysol™ DR-3)	9.00
Base - Ammonia (28%)	0.86
Water	405.69

The resulting prepaint should have a total volume of 100 gallons, a total weight of 1,254.9 lbs., total PVC of 80.0%, volume solids of 40.0%, weight solids of 59.65%, density of 12.55 lbs./gallon, and 1.0% dispersant on pigment solids. Its Stormer viscosity should be 95 KU. Its pH should be 8.5 - 9.0.

Example 10

This example describes the preparation of a vinyl acetate/acrylic polymeric binder prepaint including a solvent-free vinyl acetate/acrylic binder without a coalescent. The ingredients are mixed as described in Example 4 using the ingredient amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Binder - Vinyl Acetate/Acrylic (55% solids - Tg 10 °C) (Rovace™ 9900 - Rohm and Haas)	699.25
Defoamer (Foamaster™ VL)	3.00
Rheology Modifier HASE (Acrysol™ DR-3 - Rohm and Haas)	12.96
Base - Ammonia (28%)	2.90
Water	405.69

The resulting prepaint should have a total volume of 100 gallons, total weight of 885.2 lbs, volume solids of 40.0%, a weight solids of 43.5%, and density of 8.85 lbs/gallon. Its Stormer viscosity should be 99 KU. Its Brookfield viscosity should be less than 10,000 cps. Its pH should be 8.5-9.0.

Example 11

This example describes the preparation of a flat polymeric binder prepaint including a solvent-free acrylic binder and no coalescent. The ingredients are mixed as described in Example 4 using the ingredient amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Foamaster™ VL)	8.00
Binder – Acrylic Copolymer (43.5% solids – Tg -2 °C) (Rhoplex™ SF -012 - Rohm and Haas)	723.77
Rheology Modifier – HEUR (Acrysol™ RM -2020 NPR - Rohm and Haas)	3.00
Water	133.75

The resulting prepaint should have a total volume of 100 gallons, a total weight of 868.5 lbs, volume solids of 36.0%, weight solids of 38.8% and density of 8.69 lbs./gallon. Its Stormer viscosity should be 99 KU. Its Brookfield viscosity should be less than 10,000 cps. Its pH should be 8.5 - 9.0 and, if not, it is adjusted as discussed above.

Example 12

This example describes the preparation of a gloss polymeric binder prepaint using a solvent-free acrylic binder and no coalescent. The ingredients are mixed as described in Example 4 using the ingredient amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Foamaster™ VL)	8.00
Binder – Acrylic Copolymer (43.5% solids – Tg -2 °C) (Rhoplex™ SF-012 - Rohm and Haas)	767.57
Rheology Modifier – HEUR (Acrysol™ RM-2020 NPR - Rohm and Haas)	23.00
Water	61.62

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<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment –Titanium Dioxide	734.49
(Ti-Pure™ R-900 – DuPont)	
Opacifier – Voided Latex Particles (30.5% solids)	164.43
(Ropaque™ Ultra-Rohm and Haas)	
Dispersant	20.99
(Tamol™ 1254 - Rohm and Haas)	
Non-ionic Surfactant	2.00
(Triton™ CF-10)	
Biocide	2.00
(Kathon™ LX (1.5%) - Rohm and Haas)	
Defoamer	3.00
(Foamaster™ VL – source)	
Binder – Vinyl Acetate/Acrylic (55% solids – Tg 14 °C)	140.10
(RES 3083 – Rohm and Haas)	
Coalescent	11.37
(Texanol™)	
Rheology Modifier)HASE	11.47
(Acrysol™ DF3	
Base – Ammonia (28%)	1.20
Solvent – Propylene Glycol	50.00
Water	264.38



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<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment –Titanium Dioxide (Ti-Pure™ R-706-DuPont)	734.56
Opacifier – Voided Latex Particles (30.5% solids) (Ropaque™ Ultra-Rohm and Haas)	164.44
Dispersant (Tamol™ 731- Rohm and Haas))	29.38
Non-ionic Surfactant (Triton™ CF-10)	2.00
Biocide (Kathon™ LX (1.5%) - Rohm and Haas)	2.00
Defoamer (Foamaster™ VL)	3.00
Binder – Acrylic Copolymer (50% solids – Tg 28 °C) (Rhoplex™ SG-10 - Rohm and Haas)	151.20
Coalescent (Texanol™)	12.49
Rheology Modifier)HEUR (Acrysol™ RM-2020 NPR - Rohm and Haas)	42.69
Base – Ammonia (28%)	.49
Solvent – Propylene Glycol	50.00
Water	211.34

The resulting prepaint had a total volume of 100 gallons, a total weight of 1403.6 lbs, total PVC of 80%, volume solids of 40%, weight solids of 61.2%, density of 14.04 lbs/gallon, 1.0% dispersant on pigment solids, and 9.0% coalescent on binder solids. The Stormer viscosity was 100 KU. The Brookfield viscosity was 4,010 cps. The pH was 8.8.

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Example 15

This example describes the preparation of an exterior pigment extender prepaint. It was prepared by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Nephilene Syenite (7.5μ) (Minex™ 4)	697.16
Dispersant (Tamol™ 731 –Rohm and Haas)	27.89
Non-ionic Surfactant (Triton™ CF-10)	2.00
Biocide Kathon™ LX (1.5%) – Rohm and Haas)	2.00
Defoamer (Foamaster™ VL)	3.00
Binder – Acrylic (53.5% solids – Tg 18 °C) (Rhoplex™ Multilobe 200 – Rohm and Haas)	139.98
Coalescent (Texanol™)	5.24
Rheology Modifier – HEUR (Acrysol™ RM – 2020 – Rohm and Haas)	101.80
Solvent –Propylene Glycol	50.00
Water	254.40

The resulting prepaint had a total volume of 100 gallons, a total weight of 1281.5 lbs, total PVC of 80.0%, volume solids of 40.0%, weight solids of 60.3%, density of 12.81 lbs/gallon, 1.0% dispersant on pigment solids, and 7.0% total coalescent on binder solids. The Stormer viscosity was 96 KU. The Brookfield viscosity was 7,210 cps. The pH was 9.8.

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Example 16

This example describes the preparation of an interior pigment extender prepaint. It was prepared by combining the following ingredients:

<u>Ingredients</u>	<u>Amounts (lbs./100 gallons)</u>
Pigment - Calcium Carbonate (5 μ) (Snowflake TM)	451.20
Pigment - Aluminum Silicate (1.4 μ) (Optiwhite TM)	220.37
Dispersant (Tamol TM 1254 - Rohm and Haas)	19.19
Non-ionic Surfactant (Triton TM CF-10)	2.00
Biocide (Kalthon TM LX (1.5%) - Rohm and Haas)	2.00
Defoamer (Foamaster TM VL)	3.00
Binder - Vinyl Acetate/Acrylic (55% solids - Tg 14 °C) (RES 3083 - Rohm and Haas)	140.10
Coalescent (Texanol TM)	6.93
Rheology Modifier - HASE (Acrysol TM DR-3 - Rohm and Haas)	11.00
Base - Ammonia (28%)	0.86
Solvent - Propylene Glycol	50.00
Water	348.48

The resulting prepaint had a total volume of 100 gallons, a total weight of 1255.1 lbs, total PVC of 80.0%, volume solids of 40.0%, a weight solids of 59.7%, density of 12.55 lbs/gallon, 1.0% dispersant on pigment solids, and 9.0% total coalescent on binder solids. The Stormer viscosity was 102 KU. The Brookfield viscosity was 3,410 cpa. The pH was 8.9.

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Example 17

This describes the preparation of a vinyl acetate/acrylic binder prepaint. It was prepared by combining the following ingredients:

<u>Ingredients</u>	<u>Amounts (lbs./100 gallons)</u>
Defoamer (Foamaster™ VL)	3.00
Binder – Vinyl Acetate/Acrylic (55% solids – Tg 14 °C) (RES 3083 – Rohm and Haas)	700.48
Coalescent (Texanol™)	34.67
Rheology Modifier – HASE (Acrysol™ DR-3 – Rohm and Haas)	12.96
Base – Ammonia (28%)	2.90
Solvent – Propylene Glycol	50.00
Water	83.48

The resulting prepaint had a total volume of 100 gallons, a total weight of 887.5 lbs, volume solids of 40.0%, a weight solids of 43.4%, a density of 8.88 lbs/gallon, and 9.0% coalescent on binder solids. Its Stormer viscosity was 98.0. The Brookfield viscosity was 13,600 cps. Its pH was 9.0.

Example 18

This example describes the preparation of a flat acrylic binder prepaint. It was prepared by combining the following ingredients:

<u>Ingredients</u>	<u>Amounts (lbs./100 gallons)</u>
Defoamer (Foamaster™ VL)	3.00
Binder – Acrylic (53.5% solids – Tg 18 °C) (Rhoplex™ Multilobe 200 – Rohm and Haas)	699.92
Coalescent (Texanol™)	26.21
Rheology Modifier – HEUR (Acrysol™ RM-2020 NPR – Rohm and Haas)	1.44
Base – Ammonia (28%)	0.35
Solvent – Propylene Glycol	50.00
Water	96.59

The resulting prepaint had a total volume of 100 gallons, a total weight of 877.5 lbs, volume solids of 40.0%, weight solids of 42.7%, density of 8.78 lbs/gallon, and 7.0% coalescent

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on binder solids. Its Stormer viscosity was 94.0. The Brookfield viscosity was 4,900 cps. Its pH was 8.9.

Example 19

This example describes the preparation of a gloss acrylic binder prepaint. It was prepared by combining the following ingredients:

<u>Ingredients</u>	<u>Amounts (lbs./100 gallons)</u>
Defoamer (Foamaster™ VL)	3.00
Binder – Acrylic Copolymer (50% solids – Tg 28 °C) (Rhoplex™ SG-10M – Rohm and Haas)	755.99
Coalescent (Texanol™)	37.80
Rheology Modifier – HEUR (Acrysol™ RM-2020 NPR – Rohm and Haas)	11.62
Base – Ammonia (28%)	0.35
Solvent – Propylene Glycol	50.00
Water	17.68

The resulting prepaint had a total volume of 100 gallons, a total weight of 876.4 lbs, volume solids of 40.0%, weight solids of 43.1%, a density of 8.76 lbs/gallon, and 10.0% coalescent on binder solids. Its Stormer viscosity was 96. The Brookfield viscosity was 5,000 cps. Its pH was 8.8.

Example 20

This example describes the preparation of a white prepaint by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment – Titanium Dioxide (Ti-Pure™ R-706 -- DuPont)	1001.66
Dispersant (Tamol™ 1124 – Rohm and Haas)	20.03
Defoamer (Drewplus™ L-475)	1.00
Binder Acrylic (50% solids – Tg 28 °C) (Rhoplex™ SG – 10M – Rohm and Haas)	189.00
Opacifer – Voided Latex Particles (Ropaque™ OP-96 – Rohm and Haas)	172.50
Coalescent (Texanol™)	14.72

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Rheology Modifier	2.00
(Acrysol™ RM-8W – Rohm and Haas)	
Base – Ammonia (28%)	1.65
Water	200.44

The resulting prepaint should have a total volume of 100 gallons, a total weight of 1,603.0 lbs, total PVC of 80.0%, volume solids of 50.0%, weight solids of 71.7%, a density of 16.03 lbs/gallon, 1% dispersant on pigment solids, and 10.0% coalescent on latex solids.

Example 21

This example describes the preparation of a white pigment prepaint with pigmented vesiculated polymeric beads. The pigmented vesiculated polymeric beads have a particle size of 12.5 microns, approximately 7% (s/s) titanium dioxide, and a void volume of approximately 77%. The ingredients are mixed as described in Example 1 using the ingredient amounts set out below.

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigmented Vesiculated Polymeric Bead (Spindrift™ 25)	733.00
Dispersant (Tamol™ 1124 - Rohm and Haas)	0
Defoamer (Drewplus™ L-475)	2.00
Binder Acrylic (53.5% solids – Tg 18 °C) (Rhoplex™ ML-200 - Rohm and Haas)	154
Coalescent (Texanol™)	5.90
Rheology Modifier (Acrysol™ RM-8W - Rohm and Haas)	2.55
Water	15.89

The resulting prepaint should have a total volume of 100 gallons, total weight of 913.3 lbs, total PVC of 80.0%, volume solids of 44.0%, weight solids of 28.28%, and density of 9.13 lbs/gallon. Its Stormer viscosity should be 91 KU. Its pH should be 8.5 – 9.0. If not, the pH is adjusted as described in Example 7.

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Example 22

This example describes the preparation of an exterior pigment extender prepaint by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment - Nephilene Syenite (7.5 μ) (Minex TM 4)	871.44
Dispersant (Tamol TM 1124 - Rohm and Haas)	8.71
Defoamer (Drewplus TM L-475)	2.00
Binder Acrylic (60.5% solids - Tg 16 °C) (Rhoplex TM AC-264 - Rohm and Haas)	154.74
Coalescent (Texanol TM)	6.56
Rheology Modifier (Acrysol TM RM-8W - Rohm and Haas)	3.00
Water	326.08

The resulting prepaint should have a total volume of 100 gallons, total weight of 1,382.5 lbs, total PVC of 80.0%, volume solids of 50.0%, weight solids of 69.8%, density of 13.82 lbs/gallon, 0.5% dispersant on pigment solids, and 7.0% coalescent on latex solids.

Example 23

This example describes the preparation of an interior pigment extender prepaint by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Pigment - Calcium Carbonate (12 μ) (Omyacarb TM 12)	450.67
Pigment - Calcium Carbonate (3.2 μ) (Vicron TM 15-15)	226.17
Pigment - Aluminum Silicate (1.4 μ) (Optiwhite TM)	183.76
Dispersant (Tamol TM 1124 - Rohm and Haas)	8.61
Defoamer (Drewplus TM L-475)	1.00
Binder - Vinyl Acetate/Acrylic (55% solids - Tg 14 °C) (RES 3803)	175.09
Coalescent (Texanol TM)	6.74
Rheology Modifier - HEUR (Acrysol TM SCT-275)	15.00
Base - Ammonia (28%)	0.87
Water	308.13

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The resulting prepaint should have a total volume of 100 gallons, total weight of 1376.0 lbs, total PVC of 80.0%, volume solids of 50.0%, weight solids of 69.5%, density of 13.76 lbs/gallon, 0.5% dispersant on pigment solids, and 7.0% coalescent on latex solids..

Example 24

This example describes the preparation of a vinyl acetate/acrylic binder prepaint by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Drewplus™ L-475)	2.00
Binder – Vinyl Acetate/Acrylic (55% solids – Tg 14 °C) (RES 3803)	875.62
Coalescent (Texanol™)	13.00
Rheology Modifier –HEUR (Acrysol™ SCT-275 - Rohm and Haas)	9.29

The resulting prepaint should have a total volume of 100 gallons, total weight of 899.9 lbs, a total PVC of 0.0%, volume solids of 50.0%, weight solids of 53.2%, density of 8.99 lbs/gallon, and 10.0% coalescent on latex solids.

Example 25

This example describes the preparation of a flat acrylic prepaint by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Defoamer (Drewplus™ L-475)	8.00
Binder Acrylic (60.5% solids – Tg 16 °C) (Rhoplex™ AC-264 - Rohm and Haas)	773.67
Coalescent (Texanol™)	23.40
Rheology Modifier (HEUR) (Acrysol™ RM-3W - Rohm and Haas)	13
Base – Ammonia (28%)	0.50
Solvent – Propylene Glycol	60.00
Water	1.84

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The resulting prepaint should have a total volume of 100 gallons, total weight of 880.4 lbs., total PVC of 0.0%, volume solids of 50.0%, weight solids of 53.2%, density of 8.80 lbs./gallon, and 5.0% coalescent on latex solids.

Example 26

This example describes the preparation of a gloss acrylic binder by combining the following ingredients:

<u>Ingredient</u>	<u>Amount (lbs./100 gallons)</u>
Binder - Acrylic (50% solids - Tg 28°C) (Rhoplex™ SG-10M - Rohm and Haas)	836.85
Coalescent (Texanol™)	41.84

The resulting prepaint should have a total volume of 100 gallons, a total weight of 878.7 lbs, total PVC of 0.0%, volume solids of 44.3%, weight solids of 47.4%, density of 8.78 lbs./gallon, and 10.0% coalescent on latex solids.

Example 27

This example describes the preparation of nine exterior flat latex paints of varying quality and tone using different combinations of the white pigment prepaint of Example 14, the exterior pigment extender prepaint of Example 15, the vinyl acetate-acrylic (PVA) binder prepaint of Example 17, and the flat acrylic binder prepaint of Example 18. The paints are formulated by adding the white pigment prepaint and exterior pigment extender prepaint to the binder prepaints and mixing well.

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Paint			Prepaints (wt.)				Water
No.	PVC (%)	Volume Solids (%)	White	Exterior Extender	PVA Binder	Flat Acrylic Binder	(wt.)
			(Ex 14)	(Ex 15)	(Ex 17)	(Ex 18)	
27-1	45.0	35.0	395.53	269.60	—	335.92	104.34
27-2	50.0	30.0	317.19	311.10	—	246.80	208.68
27-3	50.0	30.0	263.69	359.94	197.64	51.38	208.68
27-4	42.5	35.0	197.77	415.12	—	359.92	104.34
27-5	47.5	30.0	158.60	425.86	—	267.37	208.68
27-6	47.5	30.0	131.84	450.28	214.11	55.67	208.68
27-7	40.0	35.0	—	560.64	—	383.91	104.34
27-8	45.0	30.0	—	540.62	—	287.93	208.68
27-9	45.0	30.0	—	540.62	230.58	59.95	208.68

Paints 27-1, 27-4 and 27-7 are premium quality light, mid and deep tone paints; paints 27-2, 27-5 and 27-8 are first quality light, mid and deep tone paints; and paints 27-3, 27-6 and 27-9 are second quality light, mid and deep tone paints.

Example 28

This example describes the preparation of nine exterior satin latex paints of varying quality and tone using different combinations of the white pigment prepaint and exterior pigment extender prepaint of Examples 14 and 15, respectively, and the vinyl acetate/acrylic binder (PVA) and flat acrylic binder prepaings of Examples 17 and 18. The paints are formulated as described above.

Paint			Prepaints (wt.)				Water
No.	PVC (%)	Volume Solids (%)	White	Exterior Extender	PVA Binder	Flat Acrylic Binder	(wt.)
			(Ex 14)	(Ex 15)	(Ex 17)	(Ex 18)	
28-1	35.0	35.0	395.53	129.44	—	431.90	104.34
28-2	37.0	30.0	351.59	123.51	—	353.75	208.68
28-3	40.0	26.0	263.69	175.73	228.35	59.41	292.15
28-4	32.5	36.0	197.77	287.98	—	468.92	83.47
28-5	34.5	30.0	175.75	253.98	—	374.31	208.68
28-6	37.5	26.0	131.84	270.07	242.63	63.12	292.12
28-7	30.0	36.0	—	432.50	—	493.60	83.47
28-8	32.0	30.0	—	384.44	—	394.88	208.68
28-9	35.0	26.0	—	364.42	256.87	66.86	292.15

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Paints 28-1, 28-4 and 28-7 are premium quality light, mid and deep tone paints; paints 28-2, 28-5 and 28-8 are first quality light, mid and deep tone paints; and paints 28-3, 28-6 and 28-9 are second quality light, mid and deep tone paints.

Example 29

This example describes the preparation of nine exterior gloss latex paints of varying quality and tone using different combinations of the white pigment and exterior extender preprints of Examples 14 and 15 and vinyl acetate/acrylic binder (PVA) and gloss acrylic binder preprints of Examples 17 and 19. The paints are formulated as described above.

Paint No.	PVC (%)	Volume Solids (%)	Prepaints (wt.)			Water (wt.)
			White (Ex 14)	PVA Binder (Ex 17)	Gloss Acrylic Binder (Ex 19)	
29-1	26.0	35.0	435.66	—	494.85	104.34
29-2	30.0	30.0	460.50	—	413.60	166.94
29-3	30.0	30.0	429.93	304.15	88.51	208.68
29-4	13.0	35.0	217.83	—	630.87	104.34
29-5	15.0	30.0	230.25	—	557.38	166.94
29-6	15.0	30.0	214.96	409.14	119.06	208.68
29-7	—	35.0	—	—	766.89	104.34
29-8	—	30.0	—	—	701.15	166.94
29-9	—	30.0	—	514.12	149.61	208.68

Paints 29-1, 29-4 and 29-7 are premium quality light, mid and deep tone paints; paints 29-2, 29-5 and 29-8 are first quality light, mid and deep tone paints; and paints 29-3, 29-6 and 29-9 are second quality light, mid and deep tone paints.

Example 30

This example describes the preparation of nine interior flat latex paints using different combinations of the white pigment and interior extender preprints of Examples 14 and 16 and the vinyl acetate/acrylic (PVA) and flat acrylic binder preprints of Examples 17 and 18. The paints are formulated as described above.

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Paint			Prepaints (wt.)				Water (wt.)
No.	PVC (%)	Volume Solids (%)	White	Interior Extender	PVA Binder	Flat Acrylic Binder	
			(Ex 14)	(Ex 16)	(Ex 17)	(Ex 18)	
30-1	50.0	30.0	351.59	273.94	197.64	51.38	208.68
30-2	60.0	30.0	263.69	470.21	166.40	—	208.68
30-3	75.0	25.0	128.02	620.95	34.67	—	313.02
30-4	47.5	15.0	175.79	401.73	214.11	55.67	208.68
30-5	57.5	30.0	131.84	558.69	187.20	—	208.68
30-6	72.5	25.0	64.01	653.67	52.00	—	313.02
30-7	45.0	30.0	—	529.51	230.58	59.95	208.68
30-8	55.0	30.0	—	647.18	208.01	—	208.68
30-9	70.0	25.0	—	686.40	69.34	—	313.02

Paints 30-1, 30-4 and 30-7 are premium quality light, mid and deep tone paints; paints 30-2, 30-5 and 30-8 are first quality light, mid and deep tone paints; and paints 30-3, 30-6 and 30-9 are second quality light, mid and deep tone paints.

Example 31

This example describes the preparation of nine interior satin latex paints using the white pigment and interior extender prepaints of Examples 14 and 16 and the vinyl acetate/acrylic (PVA) and flat acrylic binder prepaints of Examples 17 and 18. The paints are formulated as described above.

Paint			Prepaints (wt.)				Water (wt.)
No.	PVC (%)	Volume Solids (%)	White	Interior Extender	PVA Binder	Flat Acrylic Binder	
			(Ex 14)	(Ex 16)	(Ex 17)	(Ex 18)	
31-1	35.0	36.0	395.53	140.51	355.75	92.49	83.47
31-2	37.0	30.0	351.59	120.98	357.77	—	208.68
31-3	40.0	20.0	263.69	172.12	288.43	—	292.15
31-4	32.5	36.0	197.77	282.06	375.51	97.96	83.47
31-5	34.5	30.0	175.79	248.76	378.57	—	208.68
31-6	37.5	26.0	131.84	264.52	306.46	—	292.15
31-7	30.0	36.0	—	423.61	395.28	102.77	83.47
31-8	32.0	30.0	—	376.54	399.37	—	208.68
31-9	35.0	26.0	—	356.93	324.49	—	292.15

Paints 31-1, 31-4 and 31-7 are premium quality light, mid and deep tone paints; paints 31-2, 31-5 and 31-8 are first quality light, mid and deep tone paints; and paints 31-3, 31-6 and 31-9 are second quality light, mid and deep tone paints.

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Example 32

This example describes the preparation of nine interior gloss latex paints using the white pigment prepaint of Example 14 and the vinyl acetate/acrylic (PVA) and gloss acrylic binder prepaints of Examples 17 and 19. The paints are formulated as described above.

Paint No.	PVC (%)	Volume Solids (%)	Prepaints (wt.)			Water (wt.)
			White (Ex 14)	PVA Binder (Ex 17)	Gloss Acrylic Binder (Ex 19)	
32-1	26.0	35.0	435.66	—	494.85	104.34
32-2	30.0	38.0	429.93	304.15	88.51	208.68
32-3	30.1	28.0	403.18	366.31	—	250.42
32-4	13.0	35.0	217.83	—	630.87	104.34
32-5	15.0	30.0	214.96	409.14	119.06	208.68
32-6	15.0	28.0	201.59	493.78	—	250.42
32-7	—	35.0	—	—	766.89	104.34
32-8	—	30.0	—	514.12	149.61	208.68
32-9	—	28.0	—	621.24	—	250.42

Paints 32-1, 32-4 and 31-7 are premium quality light, mid and deep tone paints; paints 32-2, 32-5 and 32-8 are first quality light, mid and deep tone paints; and paints 32-3, 32-6 and 32-9 are second quality light, mid and deep tone paints.

Example 33

This example describes the preparation of a latex paint useful for architectural coatings which can be prepared using the white prepaint of Example 20, the exterior pigment extender of Example 22, and the flat acrylic binder prepaint of Example 25. The paint is formulated as described above.

Paint		Prepaints (wt.)			Water (wt.)
PVC (%)	Volume Solids (%)	White (Ex 20)	Exterior Extender (Ex 22)	Flat Acrylic Binder (Ex 25)	
35	48	331.27	294.95	475.42	33.39

The resulting paint should be a premium paint having a satin finish and a light tone.

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Example 34

This example describes the preparation of a low solids interior flat paint using the white pigment prepaint of Example 20, the interior pigment extender of Example 23, and the vinyl acetate/acrylic (PVA) binder prepaint of Example 24.

Paint		Prepaints (wt.)			Water
PVC (%)	Volume Solids (%)	White (Ex 20)	Interior Extender (Ex 23)	PVA Binder (Ex 24)	(wt.)
75	15	107.22	294.97	16.87	584.31

Example 34

This example describes the preparation of paints using the prepaints of Examples 1 to 6. The paints were prepared by mixing the pigment prepaint(s) with the binder prepaint(s), then adding the thickeners, water and colorants and mixing well. The Stormer viscosity, ICI viscosity, and pH were the equilibrated measured values.

Part A – Exterior Flat Paints (Best and Good)

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment	Exterior Extender Pigment	PVA Binder	Flat Acrylic Binder	Acrysol SCT-275	Acrysol RM 2020 NPR		
	(Ex 1)	(Ex 2)	(Ex 4)	(Ex 6)				
34-1 ^a	353.86	278.01	—	306.97	10.40	14.00	149.68	—
34-2 ^b	235.96	351.50	177.30	46.09	26.40	11.20	237.06	—
34-3 ^a	—	516.00	—	351.00	32.68	—	146.45	162
34-4 ^b	—	500.00	206.58	53.70	48.48	—	237.06	162

- a. Best light tone and deep tone paints
- b. Good light tone and deep tone paints

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Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume ^a (gallons)	Weight ^c (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (b/gal)
34-1 ^e	102	1.15	8.76	100	1112.92	45.05	35.08	50.66	11.13
34-2 ^d	101	0.87	8.30	100	1085.52	50.04	30.05	45.68	10.86
34-3 ^e	110	1.90	9.02	100	1046.13	39.94	35.00	47.92	10.46
34-4 ^f	121	1.80	8.70	100	1045.82	45.09	29.76	43.25	10.36

- c. There was 0.44% dispersant based on dry pigment and 7.48% coalescent based on dry polymer.
- d. There was 0.46% dispersant based on dry pigment and 7.40% coalescent based on dry polymer.
- e. There was 0.50% dispersant based on dry pigment and 7.00% coalescent based on dry polymer.
- f. There was 0.50% dispersant based on dry pigment and 7.00% coalescent based on dry polymer.

Part B – Exterior Satin Paint (Better)

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment (Ex 1)	Exterior Extender Pigment (Ex 2)	PVA Binder (Ex 4)	Flat Acrylic Binder (Ex 6)	Acrysol SCT-275	Acrysol RM 2020 NPR		
34-5	314.56	137.00	—	323.00	17.82	17.58	234.22	—

Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume (gallons)	Weight (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (lbs./gal)
34-5	104	1.19	8.95	100.00	1044.18	36.94	29.96	43.26	10.44

There was 0.43% dispersant based on dry pigment and 7.43% coalescent based on dry polymer.

Part C - Exterior Semigloss (Best and Good)

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment	Exterior Extender Pigment	PVA Binder	Gloss Acrylic Binder	Acrysol SCT-275	Acrysol RM 2020 NPR		
	(Ex 1)	(Ex 2)	(Ex 4)	(Ex 5)				
34-6 ^a	389.40	—	—	530.37	—	15.20	98.44	—
34-7 ^b	383.98	—	85.33	294.89	22.40	26.00	217.67	—

- a. Best
b. Good

Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume (gallons)	Weight (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (lbs./gal)
34-6 ^a	99	1.19	8.54	100.00	1033.41	26.00	35.00	46.91	10.33
34-7 ^b	102	1.05	8.20	100.00	1030.27	30.00	29.90	42.43	10.30

There was a 0.40% dispersant based on dry pigment solids and a 10.00% coalescent base on dry polymer
There was a 0.40% dispersant based on dry pigment solids and a 7.97% coalescent base on dry polymer

Part D - Interior Flat

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment	Interior Extender Pigment	PVA Binder	Flat Acrylic Binder	Acrysol SCT-275	Acrysol RM 2020 NPR		
	(Ex 1)	(Ex 3)	(Ex 4)	(Ex 5)				
34-8 ^a	314.56	280.69	177.31	46.09	24.00	20.80	230.22	—
34-9	115.95	590.05	30.04	—	34.60	—	336.19	—
34-10 ^a	—	496.07	206.55	53.67	41.92	—	236.60	162
34-11	—	643.99	62.04	—	51.36	—	320.17	162

- a. Paints 34-8 and 34-10 were best light and deep tone paints.
Paints 34-9 and 34-11 were good light and deep tone paints.

Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume (gallons)	Weight (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (lbs/gal)
34-8	99	1.05	8.45	100.00	1093.67	50.00	30.00	45.88	10.94
34-9	84	0.70	8.50	100.00	1106.83	75.15	24.99	43.08	11.07
34-10	120	1.90	8.60	100.00	1034.81	45.04	29.99	43.36	10.35
34-11	108	1.88	8.80	100.00	1077.56	70.00	25.05	41.74	10.78

The percentage dispersant on dry pigment was 0.45%, 0.48%, 0.50%, and 0.50% for paint nos. 34-8 to 34-11, respectively. The percentages of Coalescent was 7.53%, 47%, 7.00% and 7.00% for paint nos. 34-8 to 34-11, respectively.

Part E - Interior Satin Paint

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment	Interior Extender Pigment	PVA Binder	Flat Acrylic Binder	Acrysol SCT-275	Acrysol RM 2020 NPR		
	(Ex 1)	(Ex 3)	(Ex 4)	(Ex 5)				
34-12	314.56	138.00	319.00	—	24.96	21.40	229.76	—

The paint was a better light tone paint.

Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume (gallons)	Weight (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (lbs/gal)
34-12	93	0.91	8.37	100.00	1047.68	37.05	29.99	43.54	10.48

The dispersant in dry pigment was 0.43%.
The coalescent in dry polymer was 7.42%.

Part F – Semi-Gloss Paint

Paint No.	Prepaint (lbs.)				Thickener (lbs.)		Water (lbs.)	Colorant (lbs.)
	White Pigment	Interior Extender Pigment	PVA Blader	Gloss Acrylic Binder	Acrysol SCT-275	Acrysol RM 2020 NPR		
	(Ex 1)	(Ex 3)	(Ex 4)	(Ex 6)				
34-13	383.98	—	294.89	85.33	22.40	26.00	217.67	—
34-14	359.89	—	347.58	—	28.80	28.00	255.70	—

Paint nos. 34-13 were better and good light tone paints.

Measured Equilibrated Values				Calculated Properties					
Paint No.	Stormer Viscosity (KU)	ICI Viscosity (cp)	pH	Volume (gallons)	Weight (lbs)	PVC (%)	Volume Solids (%)	Weight Solids (%)	Density (lbs/gal)
34-13	102	1.05	8.20	100.00	1030.27	30.01	29.91	42.43	10.30
34-14	101	1.19	7.90	100.00	1019.97	30.02	28.02	40.22	10.20

The dispersant was 0.40% on dry pigment for paints 34-13 and 34-14.
The coalescents were 7.97% and 7.47%, respectively for paints 34-13 and 34-14.

Supplier Information

Material Name	Material Type	Supplier
Tamol™ 1124	Dispersant	Rohm and Haas Company (Philadelphia, PA)
Tamol™ 1254	Dispersant	Rohm and Haas Company (Philadelphia, PA)
Tamol™ 731	Dispersant	Rohm and Haas Company (Philadelphia, PA)
Acrysol™ DR-3	Thickener/Rheology Modifier	Rohm and Haas Company (Philadelphia, PA)
Acrysol™ RM-2020 NPR	Thickener/Rheology Modifier	Rohm and Haas Company (Philadelphia, PA)
Acrysol™ RM-8W	Thickener/Rheology Modifier	Rohm and Haas Company (Philadelphia, PA)
Acrysol™ RM-825	Thickener/Rheology Modifier	Rohm and Haas Company (Philadelphia, PA)

Rhoplex™ Multilobe 200	Binder	Rohm and Haas Company (Philadelphia, PA)
Rhoplex™ SG-10M	Binder	Rohm and Haas Company (Philadelphia, PA)
RES 3083	Binder	Rohm and Haas Company (Philadelphia, PA)
Kathon™ LX 1.5%	Biocide	Rohm and Haas Company (Philadelphia, PA)
Triton™ CF-10	Surfactant	Union Carbide Corporation (Danbury, CT)
Foamaster™ VL	Defoamer	Henkel Corporation
Drewplus™ L-475	Defoamer	Drew Chemical Corporation
Ti-Pure™ R-746	Titanium Dioxide Slurry	E.I. Dupont de Nemours and Co., Inc. (Wilmington, DE)
Ti-Pure™ R-706	Titanium Dioxide	E.I. Dupont de Nemours and Co., Inc. (Wilmington, DE)
Ti-Pure™ R-900	Titanium Dioxide	E.I. Dupont de Nemours and Co., Inc. (Wilmington, DE)
Ti-Pure™ R-902	Titanium Dioxide	E.I. Dupont de Nemours and Co., Inc. (Wilmington, DE)
Minex™ 4	Extender	Indusmin, Inc.
Optiwhite™	Extender	Burgess Pigment Company
Snowflake™	Extender	ECC America, Inc.
Vicron™ 15-15	Extender	Pfizer
Omyacarb™	Extender	Omya
Texanol™	Coalescent	Eastman Chemical

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WHAT IS CLAIMED:

1. A set of prepaints sufficient to form at least one paint line, comprising:
 - a. at least one fluid prepaint x, comprising at least one opacifying pigment;
 - b. at least one fluid prepaint y, comprising at least one extender pigment; and
 - c. at least one fluid prepaint z, comprising at least one polymeric binder;

wherein prepaints x, y, and z are different from each other; and

wherein prepaints x, y, and z are mutually compatible.
2. The set of prepaints of claim 1, wherein the number of prepaints is from 3 to 15.
3. The set of prepaints of claim 1, wherein prepaint x further comprises at least one particulate polymeric binder adsorbed onto the opacifying pigment.
4. The set of prepaints of claim 1, wherein prepaint y further comprises at least one particulate polymeric binder adsorbed onto the extender pigment.
5. A method of forming at least one paint line, comprising:
 - a. providing a set of prepaints, comprising:
 - i. at least one fluid prepaint x, comprising at least one opacifying pigment;
 - ii. at least one fluid prepaint y, comprising at least one extender pigment ;

and
 - iii. at least one fluid prepaint z, comprising at least one polymeric binder;

wherein prepaints x, y, and z are different from each other; and

wherein prepaints x, y, and z are mutually compatible; and
 - b. dispensing predetermined amounts of prepaint(s) x, prepaint(s) y, and prepaint(s) z into containers or application devices to form at least one paint line.
6. A method of forming a range of paints, the range comprising at least two paint lines, comprising the steps of:
 - a. providing a set of prepaints sufficient to formulate at least two paint lines, comprising:
 - i. at least one fluid prepaint x, comprising at least one opacifying pigment;
 - ii. at least one fluid prepaint y, comprising at least one extender pigment ;
 - iii. at least one fluid prepaint z, comprising at least one polymeric binder; and
 - iv. at least one additional fluid prepaint x', y', or z';

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wherein prepaints x, y, and z are different from each other; and
 wherein prepaints x, y, and z are mutually compatible;

b. dispensing predetermined amounts of prepaint(s) x, prepaint(s) y, prepaint(s) z, and the at least one additional prepaint into containers or application devices to form a range of paints.

7. The method of claim 5 or claim 6, further comprising the step of mixing prepaint(s) x, prepaint(s) y, prepaint(s) z, and at least one additional prepaint x', y', or z' before, while, or after they are dispensed into the container.
8. The method of claim 5 or claim 6, further comprising the step of mixing prepaint(s) x, prepaint(s) y, prepaint(s) z, and at least one additional preppint x', y', or z' before or while they are dispensed into the application device.
9. The method of claim 5 or claim 6, further comprising the step of adjusting the viscosity of the dispensed prepaints before, while, or after they are dispensed into the container.
10. The method of claim 5 or claim 6, further comprising the step of adjusting the viscosity of the dispensed prepaints before or while they are dispensed into the application device.
11. The method of claim 5 or claim 6, further comprising the step of adding additional materials that enhance the application or final performance properties of the paints.
12. The method of claim 5 or claim 6, further comprising the step of adding at least one colorant to the dispensed prepaints.
13. The method of claim 5 or claim 6, wherein prepaint x further comprises at least one particulate polymeric binder absorbed onto the opacyfying pigment.
14. The method of claim 5 or claim 6, wherein prepaint y further comprises at least one particulate polymeric binder absorbed onto the extender pigment.
15. The method of claim 5 or claim 6, wherein the method is carried out at a paint manufacturing facility.
16. The method of claim 5 or claim 6, wherein the method is carried out at a point-of-sale.
17. The method of claim 5 or claim 6, wherein the method is carried out at a point-of-use.
18. The method of claim 5 or claim 6, wherein the method is controlled by a computer.
19. The method of claim 5 or claim 6, wherein the number of prepaints is from 4 to 15.

20. A fluid titanium dioxide prepaint useful for formulating a one pack, pigmented latex paint containing other paint ingredients, which prepaint consists essentially of at least one opacifying pigment, at least one dispersant, at least one thickener, and water;
wherein the dispersant(s) and the thickener(s) are mutually compatible with the pigment(s) and with the latex paint ingredients, and
wherein the prepaint has a volume solids content of about 30% to about 70% and a Stormer viscosity of about 50 to about 250 KU.
21. The prepaint of claim 20, wherein the volume solids content is 35% to 50% and the Stormer viscosity is 60 to 150 KU.
22. A fluid titanium dioxide prepaint useful for formulating a one pack, pigmented latex paint containing other paint ingredients, which prepaint consists essentially of at least one opacifying pigment, at least one dispersant, at least one thickener, at least one film-forming or nonfilm-forming polymer, and water;
wherein the dispersant(s), the thickener(s), and the polymer(s) are compatible with the pigment(s) and with the other paint ingredients, and
wherein the prepaint has a volume solids content of about 30% to about 70%, a PVC of about 35% to 100%, a Stormer viscosity of about 50 to about 250 KU, and wherein the prepaint is stable to sedimentation.
23. The prepaint of claim 22, wherein the volume solids content is about 35% to about 50%, the PVC is about 50 to 100%, and the Stormer viscosity is about 60 to about 150 KU.
24. The prepaint of claim 22, wherein the polymer is adsorbed onto the opacifying pigment.
25. The prepaint of claim 20 or 22, wherein the opacifying pigment is a material selected from the group consisting of titanium dioxide, zinc oxide, lead oxide, a synthetic polymer pigment and mixtures thereof.
26. The prepaint of claim 25, wherein the opacifying pigment is rutile titanium dioxide.
27. The prepaint of claim 25, wherein the synthetic polymer pigment is voided latex polymer particles.
28. The prepaint of claim 20 or 22, wherein the dispersant is a material selected from the group consisting of 2-amino-2-methyl-1-propanol (AMP), dimethylaminoethanol (DMAE), potassium tripolyphosphate (KTPP), trisodium polyphosphate (TSPP), citric

acid, polyacrylic acid, diolefin/maleic anhydride adducts, hydrophobically-modified polyacrylic acid, hydrophilically-modified polyacrylic acid salts, and mixtures thereof.

29. The prepaint of claim 20 or 22, wherein the thickener is a material selected from the group consisting of ASE, HASE, HEUR, cellulosic, hydrophobically-modified cellulosic, hydrophobically-modified polyacrylamide, polyvinyl alcohol, fumed silica, attapulgite clay, titanate chelating agent and mixtures thereof.
30. The prepaint of claim 22, wherein the polymer is selected from the group consisting of acrylic, polyvinyl acetate, styrene-acrylic, styrene-butadiene, vinyl acetate-acrylic, ethylene-vinyl acetate, vinyl acetate-vinyl versatate, vinyl acetate-vinyl maleate, vinyl acetate-vinyl chloride-acrylic, ethylene-vinyl acetate-acrylic polymers and mixtures thereof, further consisting essentially of up to about 10% by weight of the polymer of functional and other monomers.
31. The prepaint of claim 20 or 22, further consisting essentially of at least one additive selected from the group consisting of acid, base, defoamer, coalescent, cosolvent, mildewicide, biocide and antifreeze agent;
wherein the minor additive is present at a level of less than about 10% by weight, based on the total weight of the prepaint.
32. A fluid pigment extender prepaint useful for formulating a one pack, pigmented latex paint containing other paint ingredients, which prepaint consists essentially of at least one mineral extender, at least one thickener, an optional polymeric binder and water; wherein the pigment extender prepaint has a volume solids content of about 30% to about 70%, a PVC of about 35% to 100%, and a Stormer viscosity of about 50 to about 250 KU; and wherein the prepaint ingredients are compatible with each other and with the ingredients of the other prepaints desired to be used therewith.
33. A set of two prepaints useful for formulating a latex paint, comprising:
(a) the prepaint x of claim 20 or 22; and
(b) a fluid polymeric binder prepaint z which consists essentially of a water-borne polymeric binder having a Tg of about -30°C to about 70°C and water;
wherein prepaint z has a volume solids content of about 25% to about 70% and a Brookfield viscosity of less than about 100,000 centipoise at a shear rate of 1.25 reciprocal seconds; and

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ABSTRACT

Methods of providing a paint line and a range of paints using preprints are provided. A preprint containing opacifying pigment and sets of preprints including the preprint are also provided.

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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 01 - 45,993
FECHA : JULIO 27 DE 2001

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	8036384	27/07/2001	24,397,220.00

***** CONCEPTO *****

CANT. RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1 30005-01-01 SOLICITUDES	1 TRAMITES DE SOL. DE PATENTE DE IN	356,640.00
	TOTAL :	\$ 356,640.00

SOM: TRESCIENTOS CINCUENTA Y SEIS MIL SEISCIENTOS CUARENTA PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

Bolo 12693-801-001-7

Carrera 13 No. 27-00 Pisos 5, 7 y 10
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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 01 - 45,967
FECHA : JULIO 27 DE 2001

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	8036384	27/07/2001	24,397,220.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50005-01-01	SOLICITUDES	
		02 INVOCACION DE UNA PRIORIDAD EN NU	100,000.00
		TOTAL :	100,000.00

SON: CIENTO MIL PESOS

RESPONSABLE : _____

RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

206 12693-801-001-7

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Industria y Comercio

SUPERINTENDENCIA

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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

NIT : 800176089-2

RECIBO OFICIAL DE CAJA : 01 - 45,968
FECHA : JULIO 27 DE 2001

***** CONSIGNACION *****

DEPOSITANTE	TIPO PAGO	BANCO	CUENTA	No. PAGO	FECHA PAGO	Vr. PAGO
CAVELIER ABOGADOS	CONSIGNACION	BANCO POPULAR	050-00110-6	8036584	27/07/2001	24,397,220.00

***** C O N C E P T O *****

CANT.	RENTISTICO	CONCEPTO	TOTAL CONCEPTO
1	50003-01-01 SOLICITUDES	02 INVOCACION DE UNA PRIORIDAD EN MU	100,000.00
		TOTAL :	100,000.00

SON: CIENTO MIL PESOS

RESPONSABLE : _____
RECIBO DE CAJA APLICADO AL EXPEDIENTE No. _____

Colo 12693-801-001-7

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Dependencia: 2020 DIVISION DE NUEVAS CREACIONES

USUARIO RADICADOR

PATENTE DE INVENCION [X]

MODELO DE UTILIDAD

[] [X]

- Indicación de que se solicita la concesión de una patente [] [X]
- Datos de identificación del solicitante o de la persona que presenta la solicitud [] [X]
- Descripción de la invención [] [X]
- Dibujos de ser estos pertinentes [] [X]
- Comprobante de Pago de las tasas establecidas [] [X]

COMPLETA [X]

INCOMPLETA

[] []

DISEÑO INDUSTRIAL []

- Indicación de que se solicita el registro de Diseño Industrial [] []
- Datos de identificación del solicitante o de la persona que presenta la solicitud [] []
- Representación gráfica y fotográfica del Diseño Industrial o muestra del material que incorpora el diseño [] []
- Comprobante de pago de las tasas establecidas [] []

COMPLETA []

INCOMPLETA

[] []

ESQUEMA DE TRAZADO []

- Indicación de que se solicita el registro de un Esquema de trazado [] []
- Datos de identificación del solicitante o de la persona que presenta la solicitud [] []
- Representación gráfica del esquema de trazado [] []
- Comprobante de pago de las tasas establecidas [] []

COMPLETA []

INCOMPLETA

[] []

Firma Responsable

Fecha

Carpetas No. 27 de 1992 y 2000
Comunicación No. 2000 de
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Bogotá D.C. Colombia

RETIRO FOLIOS 244, 245 y 246
DE EXTRACTO 2006/00



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Industria y Comercio
SUPERINTENDENCIA

Folio 168

2020
Bogotá, D. C.

Doctor(a)
EMILIO FERRERO
Apoderado(a)

REFERENCIA:	Radicación	01-64212
	Trámite	002
	Evento	001
	Actuación	430
	Oficio No.	2845
	Folios	001

Como resultado del examen de forma, realizado con fundamento en el artículo 38 de la Decisión 486 de la Comisión de la Comunidad Andina, se le comunica que:

Debe aportar la traducción de los capítulos reivindicatorios.

En cumplimiento del artículo 39 de la Decisión 486, en concordancia con el artículo 85 de la misma decisión, se le requiere para que dentro del término de dos (2) meses siguientes a la fecha de notificación del presente oficio, complete los requisitos anteriormente enunciados. En caso de no dar cumplimiento al presente requerimiento, la solicitud se considerará abandonada y perderá su prelación.

Notifíquese el presente oficio conforme a lo dispuesto en el artículo 8 de la Resolución 210 del 15 de enero del 2001.


ALIX CARMENZA CÉSPEDES DE VERGEL
Jefe de la División de Nuevas Creaciones

El anterior requerimiento fue notificado por fijación en lista de fecha

15 Nov. 2001

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